# THE LANCET.

**A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.**

TELEGRAPHIC ADDRESS—LANCET, WESTRAND LONDON TELEPHONE NUMBER—GERRARD 5356

No. XV. of Vol. I., 1916.
No. 4832. Vol. CXC.

LONDON, SATURDAY, APRIL 8, 1916.

Price 6d.



Now Ready. viii.+280 pp. Price 5s. net. With original Photographs and 143 special Prescriptions.

## TREATMENT OF DISEASES OF THE SKIN.

By KNOWSLEY SIBLEY, M.D. Camb.
Physician to St. John's Hospital for Diseases of the Skin.

"The most recent methods of treatment, $CO_2$, hyperæmia, X rays, electrolysis, ionisation, high-frequency, ..... are explained. It will be of the greatest value to the general practitioner, and we can thoroughly recommend it."—PRACTITIONER.

London: Edward Arnold, 41 and 43, Maddox-street, W.

Now Ready. Fifth Edition. Pp. x. + 416. With 389 Illustrations. Price 15s. net.

## BRADFORD AND LOVETT'S ORTHOPÆDIC SURGERY.

"There is no book better able to give the desired information on debatable points than this."—MEDICAL PRESS & CIR.

Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden, London.

Now Ready. Pp. viii. + 1040. With 78 Illustrations. Price 21s. net.

## MATHEWS' PHYSIOLOGICAL CHEMISTRY. By A. P. MATHEWS, Ph.D., Professor of Physiological Chemistry, University of Chicago.

"It embodies the most recent views and theories, and is without a doubt the most satisfactory exposition of the subject published."
—MEDICAL RECORD.

London: Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

THE PRESCRIBER'S STANDARD WORK OF REFERENCE.

Price 10s. 6d. net; post free (inland) 10s. 10d.

## SQUIRE'S POCKET COMPANION

to the BRITISH PHARMACOPŒIA, 1914.

Pp. vi.+1175. With 1252 Original Figures and 8 Coloured Plates. Price 21s. net.

CALOT'S

## INDISPENSABLE ORTHOPÆDICS

Translated from the Sixth French Edition
By A. H. ROBINSON, M.D., M.R.C.S., and LOUIS NICOLE.

*In less than four years this book has reached the sixth edition, and has been translated into five languages.*

"It supplies a want. ..... It is full of valuable information."—PRACTITIONER.

London: Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

IN THE PRESS. With 150 Illustrations.

By CHARLES J. HEATH, F.R.C.S. Eng.,
Late Surgeon to the Hospital for Diseases of the Throat, Golden-square, London.

## AURAL SUPPURATION: ITS ARREST, WITH PRESERVATION OF THE HEARING.

*The indications for performance of the Author's conservative mastoid operation.*

London: Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

MONOGRAPHS ON PHYSIOLOGY.
Edited by ERNEST H. STARLING, M.D., D.Sc., F.R.S., F.R.C.P.

## THE INVOLUNTARY NERVOUS SYSTEM.

By WALTER HOLBROOK GASKELL, M.A., M.D., F.R.S.
With Coloured Figures. 8vo. 6s. net. Just Published.
Longmans, Green & Co., 39, Paternoster-row, London, E.C.

By FREDERICK J. McCANN, M.D.Edin., F.R.C.S.Eng.,
Surgeon, Samaritan Free Hospital for Women, London, N.W.

## CANCER OF THE WOMB: ITS SYMPTOMS, DIAGNOSIS, PROGNOSIS, AND TREATMENT.

Fully illustrated. 20s. net.

LIVERPOOL MEDICO-CHIRURGICAL JOURNAL.—"Cancer of the Womb, by F. J. McCann, is a book that can be recommended alike to the general practitioner and the specialist. Written in a fluent manner, it embodies the ripe experience of a renowned operator, trained observer, and patient investigator."

EDINBURGH MEDICAL JOURNAL.—"The book is one of very great merit; it will be read with interest both by the specialist and general practitioner as an authoritative exposition of the important subject with which it deals."

PRACTITIONER.—"Dr. McCann has produced a valuable work which deserves to be widely known."

ST. BARTHOLOMEW'S HOSPITAL JOURNAL.—"The plates are excellent. This is a book we can thoroughly recommend."

London: Henry Frowde and Hodder & Stoughton.

By H. J. WARING, M.S., M.B., B.Sc.Lond., F.R.C.S., Surgeon to, and Joint Lecturer in Surgery at, St. Bartholomew's Hospital; Consulting Surgeon to the Metropolitan Hospital; Member of Court of Examiners, Royal College of Surgeons; late Examiner in Surgery, University of London.

New Edition Shortly. 8vo, extra cloth. Pp. xvi.-385, with 58 Engravings. Price 12s. 6d. net.

## SURGICAL DISEASES OF THE GALL-BLADDER, BILE DUCTS, AND LIVER.

THEIR PATHOLOGY, DIAGNOSIS, AND TREATMENT.
(*Including Jacksonian Prize Essay.*)

Henry Frowde & Hodder & Stoughton, 20, Warwick-square, E.C.

"THOROUGH, COMPLETE, AND UP TO DATE."

## ANDERS AND BOSTON'S MEDICAL DIAGNOSIS.

See Saunders' Advertisement on Page 5.

Demy 8vo. Pp. x.+572, with 28 Illustrations. Price 12s. 6d. net.

## ACUTE ABDOMINAL DISEASES: Including Abdominal Injuries and the Complications of External Hernia. By J. E. ADAMS, F.R.C.S.Eng.; and M. A. CASSIDY, M.D.

*This work, written by a Surgeon and a Physician in collaboration, should prove of value to practitioners and students alike.*

London: Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

## BY C. MANSELL MOULLIN, M.D.Oxon., F.R.C.S., Consulting Surgeon to the London Hospital.

Fourth Edition.
ENLARGEMENT OF THE PROSTATE. Price 6s.
London: H. K. Lewis & Co., Ltd., 136, Gower-street.

WHEN to OPERATE in INFLAMMATION of the APPENDIX.
Third Edition now ready. Price 2s. 6d.
London: J. Bale & Danielsson, Ltd., 83-89, Gt. Titchfield-street.

JUST PUBLISHED. With numerous Illustrations. Royal 8vo. Price 10s. 6d. net.

## THE ENDOCRINE ORGANS

AN INTRODUCTION TO THE STUDY OF INTERNAL SECRETION.

By Sir EDWARD SCHÄFER, LL.D., D.Sc., M.D., F.R.S.,
Professor of Physiology in Edinburgh University.

*Prospectus sent on application.*

Longmans, Green & Co., 39, Paternoster Row, London, E.C.

Just Published. Demy 8vo. With 136 Illustrations. 7s. 6d. net.

## MODERN METHODS OF TREATING FRACTURES.

By ERNEST W. HEY GROVES, M.S., M.D., B.Sc.Lond., F.R.C.S.Eng.,
Surgeon to the Bristol General Hospital.

The outcome of several years of close experimental and clinical study of the problems of fracture treatment, and an endeavour to examine critically the various methods which are of practical importance to the modern surgeon, and to indicate the conditions in which one or another ought to be employed.

Bristol: J. Wright & Sons Ltd. London: Simpkin & Co. Ltd.

## J. W. THOMSON WALKER, M.B., C.M.Edin., F.R.C.S.Eng.

SURGICAL DISEASES AND INJURIES OF THE GENITO-URINARY ORGANS.

880 pages, 24 Colour and 21 Black-and-White Plates and 279 Illustrations in the Text. Price 25s. net.

"Will hold its place for many years as the best English text-book of the subject."—BRITISH JOURNAL OF SURGERY.

Cassell & Co., La Belle Sauvage, London, E.C.


 THE LANCET is registered as a Newspaper. All rights reserved. 

# "ASEPSO" (Regd)

## 3% BINIODIDE MERCURIAL SOAP

**1/- PER TABLET.**

THIS IS WITHOUT DOUBT THE MOST POWERFUL GERMICIDAL SOAP MADE.

**Surgeons and Gynæcologists who carry this soap find that they need not carry Mercuric Unguents.**

**EACH TABLET BEARS A 3d. GOVERNMENT STAMP.**

## EDWARD COOK & Co., Ltd., Bow, LONDON, E.

# "LESLIES' ZINCOPLAST"

**A MUCH IMPROVED MAKE OF ZINC OXIDE PLASTER STRONGLY SELF-ADHESIVE; NON-IRRITATING; DOES NOT DRY UP.**

May be obtained on White or Pink Tinted Cloth, 5 yd. or 10 yd. spools, in all the usual widths.

*Medical Officers and Pharmacists are invited to write for Trial Sample.*

## LESLIES' Original Brown Holland Surgical Strapping (DOES NOT SLIP)

**In General Hospital Use since 1875. Has a World-wide Reputation.**

**LESLIES, Ltd., 18, Eldon Street, London, E.C.**

VALENTINE'S PREPARATION
NUTRIO PRIMA
MEAT JUICE.
The result of an original Process of Preparing Meat, and extracting its Juice, by which the elements of nutrition are obtained in a state, ready for immediate absorption.
DIRECTIONS.-Dissolve one teaspoonful of the Preparation in two or three tablespoonfuls of cold or warm water. The use of boiling water changes the character of the preparation.

# Valentine's Meat-Juice

For **Quieting** the **Irritable Stomach**, for **Aiding** the **Digestion** and for **Sustaining** and **Strengthening**, **Valentine's Meat-Juice** is **Extensively Employed** in the treatment of

**Phthisis.**

**Dr. Gouel,** *Physician in Chief of the Villepinte Hospital for Consumption, Paris, France:* "VALENTINE'S MEAT-JUICE succeeds well in cases of Anæmia and in the treatment of Tuberculosis in an advanced stage when the stomach is intolerant."

**Dr. Pietro Borromeo,** *Physician and Surgeon of the Hospital of Rome, Italy:* "I have tried VALENTINE'S MEAT-JUICE in the Tuberculosis Division of the Hospital of the Holy Spirit, and have proved the great advantages that it renders for the nutrition of the consumptive. Pleasant to the taste of the most fastidious of the sick, it does not irritate the stomach, but stimulates the peptogastric functions so as to improve notably the appetite, even in cases of continuous and high fever and of extreme loss of strength."

**For sale by European and American Chemists and Druggists.**

**VALENTINE'S MEAT-JUICE COMPANY.**

**RICHMOND. VIRGINIA. U. S. A.**

D 156

# THE LANCET.

No. 4832. LONDON, SATURDAY, APRIL 8, 1916. Vol. CXC.

# CONTENTS.

*The whole of the literary matter in THE LANCET is copyright.*

A REPORT on the Use of Stock Vaccine in Infection by the Bacillus Typhosus. With an Analysis of 230 Cases. By T. H. WHITTINGTON, M.D. Lond., Capt., R.A.M.C. (T.C.) (*Illustrated*) ..... 759

**ORIGINAL ARTICLES.**

Further Remarks on Agglutination Tests in Inoculated Persons, and the Influence of Febrile Conditions on Inoculation Agglutinins. By GEORGES DREYER, M.A. Oxon., M.D. Copenhagen; ALEX. G. GIBSON, M.D.Oxon., F.R.C.P. Lond.; and E. W. AINLEY WALKER, M.A., M.D. Oxon. (From the Department of Pathology, University of Oxford.) ..... 766

A New Apparatus for the Isolation and Cultivation of Anaerobic Micro-organisms. By JAMES MCINTOSH, M.D. Aberd.; and PAUL FILDES, M.B., B.C.Cantab. (From the Bacteriological Laboratory of the London Hospital—Prof. William Bulloch, F.R.S.)—(*Illustrated*) ..... 768

Gunshot Wounds of the Spine; their Surgical Aspect. By DONALD ARMOUR, M.B.Tor., F.R.C.S.Eng. ..... 770

Anæsthesia for Enucleation of Tonsils. By J. BLOMFIELD, M.D.Camb. ..... 772

Pain in Renal and Vesical Lesions: Its Characteristics, its Anomalies, and its Misguiding Manifestations, with 12 Illustrative Cases. By DAVID NEWMAN, M.D. Glasg.—(*Concluded*) ..... 773

On the Connexion Between "Soldier's Heart" and Hyperthyroidism. By FLORENCE A. STONEY, M.D., B.S.Lond. ..... 777

Food Economics in Relation to the War. By HARRY CAMPBELL, M.D. Lond., F.R.C.P.Lond.—III. ..... 792

**MEDICAL SOCIETIES.**

ROYAL SOCIETY OF MEDICINE:
SECTION FOR THE STUDY OF DISEASE IN CHILDREN:—Exhibition of Cases, Tracings, and Specimens ... 780
ROYAL ACADEMY OF MEDICINE IN IRELAND:
SECTION OF MEDICINE:—The Soya Bean (*Glycine Hispida*) and its Uses in Physiology and Medicine ... 781
SECTION OF PATHOLOGY:—Exhibition of Cultures and Specimens ..... 781
LIVERPOOL MEDICAL INSTITUTION ..... 782
LONDON DERMATOLOGICAL SOCIETY ..... 782

**REVIEWS AND NOTICES OF BOOKS.**

The Treatment of Acute Infectious Diseases. By Frank Sherman Meara, M.D., Ph.D. 782
The Journal of Physiology ..... 783

**NEW INVENTIONS.**

Extension Glove for Cases of Musculo spiral Paralysis.—(*Illustrated*) ..... 784

**LEADING ARTICLES.**

THE HEALTH OF MUNITION WORKERS ..... 785
THE SUPPLY OF MEDICAL MEN FOR THE NAVY AND ARMY ..... 786

**ANNOTATIONS.**

The Budget and the Medical Profession ..... 787
The Supply of Petrol to Medical Men ..... 787
The Disinfection of Septic Joints 788
Ambard's Coefficient ..... 788
The Cortical Representation of Macular and Panoramic Vision 789
Nitrogen: its Virtues and its Vices ..... 789
The Treatment of Leprosy by Chaulmoogra Oil ..... 790
Spirochætal Stomatitis ..... 790
Experimental Osseous Sporotrichosis ..... 791
Different Names for Identical Substances ..... 791

**SPECIAL ARTICLES.**

Royal Medical Benevolent Fund 784
The Culture of Medicinal Herbs 794
The Services ..... 795

VITAL STATISTICS:
Health of English Towns ..... 796
Health of Scotch Towns ..... 796
Health of Irish Towns ..... 796

**CORRESPONDENCE.**

The Duration of Life after Inguinal Colotomy (Dr. Fredk. S. Palmer) ..... 797
The Significance of Cervical Capillary Markings (Dr. Catherine Chisholm, Mr. Edmund Hughes) ..... 797
Certification of the Cause of Death (Mr. J. Brindley-James) 797
Psycho-analysis (Mr. C. F. Streeten) ..... 797
Treatment of Fibrinous Bronchitis ..... 806

**THE WAR.**

The Casualty List ..... 798
Deaths among the Sons of Medical Men ..... 798
The Honours List ..... 798
Foreign Decorations ..... 798
The Enrolment of Medical Men 798
Vacancies for Medical Officers .. 798
The Central Medical War Committee ..... 800
The Military Hospitals in Alexandria ..... 800

OBITUARY OF THE WAR:
Robert Francis Hebbert, M.R.C.S. Eng., L.R.C.P. Lond., Captain, I.M.S.—(*With Portrait*) ..... 799
Percy Haycraft Berry, M.R.C.S., L.R.C.P. Lond., Lieutenant, R.A.M.C.—(*With Portrait*) ..... 799
John Wilson, M.B., Ch.B. Edin., Lieutenant, R.A.M.C.—(*With Portrait*) ..... 799
Charles Strickland, L.R.C.P. Lond., L.R.C.S.Edin., Fleet-Surgeon, Royal Navy (retd.) 799

**MEDICAL NEWS.**

Literary Intelligence ..... 771
The Finsbury Dispensary ..... 771
Medical Magistrates ..... 782
The "Star and Garter" Home ..... 782
The Stanley Hospital, Liverpool 784
The late Mr. W. B. Richardson 787
A Devonshire Centenarian ..... 794
Children's Fresh-Air Mission .... 797
The late Mr. H. S. Lyle ..... 799
Examining Board in England by the Royal Colleges of Physicians of London and Surgeons of England: Pass-list ..... 800
University of London: Pass-list ..... 801
University of Manchester: Pass-list ..... 801
University of Sheffield: Pass-list ..... 802
University of Durham: Faculty of Medicine: Degrees conferred ..... 802
University of Aberdeen: Degrees conferred ..... 802
Dublin University School of Physic, Trinity College: Pass-list ..... 802
Metropolitan Asylums Board ... 802
The Medical and Dentists' Registers ..... 802
British Fire Prevention Committee ..... 802
Central Midwives Board ..... 803
Medical Sickness, Annuity, and Life Assurance Friendly Society ..... 803

**PARLIAMENTARY INTELLIGENCE.**

Notes on Current Topics: The Budget ..... 803
House of Commons ..... 803

Appointments ..... 805
Vacancies ..... 805
Births, Marriages, and Deaths .. 805
Notes, Short Comments, and Answers to Correspondents ... 806
Meteorological Readings ..... 806
Medical Diary ..... 807
Books, &c., received ..... 807
Acknowledgment of Communications received ..... 808

**FOR INDEX TO ADVERTISEMENTS SEE PAGES 2 & 4.**

**JOHN BALE, SONS & DANIELSSON, LTD.**

**LOCAL ANÆSTHESIA: An Illustrated Text-Book for Students and Practitioners.** Translated by RONALD E. S. KROHN. 2nd Impression. Royal octavo. Pp. 193. Price 8s. 6d. net; postage 6d.

**FIELD SERVICE NOTES FOR R.A.M.C., including Alterations and AMENDMENTS.** By MAJOR GOODWIN. Price 3s. net; postage 2d.

**THOMPSON'S COMPENDIUM of the Pharmacopœias and Formularies (Official and Unofficial).** FIFTH EDITION. Completely Revised in accordance with the New British Pharmacopœia (1914). Price 5s. net; postage 4d.

**83, 85, 87, 89, 91, GREAT TITCHFIELD STREET, LONDON, W.**

# INDEX

## MEDICAL AND OTHER BOOKS AND PUBLICATIONS


ARNOLD:—
Sibley ..... Treatment of Diseases of the Skin .. Cover 1

BAILLIERE, TINDALL & COX:—
Adams & Cassidy .. Acute Abdominal Diseases .... Cover 1
Bigg..... Indigestion ..... 4
" ..... War Diseases (Typhus, Enteric, Dysentery, and Cholera) ... 4
Bradford & Lovett's Orthopædic Surgery ..... Cover 1
Calot's Indispensable Orthopædics ..... Cover 1
Heath..... Aural Suppuration: Its Arrest, with Preservation of the Hearing .... Cover 1
Mathews .. Physiological Chemistry ..... Cover 1

BALE, SONS & DANIELSSON:—
Goodwin .. Field Service Notes for R.A.M.C., including Alterations and Amendments.. 1
Local Anæsthesia: an Illustrated Text-Book for Students and Practitioners ..... 1
Moullin .... When to Operate in Inflammation of the Appendix .. Cover 1
Thompson's Compendium of the Pharmacopœias and Formularies (Official and Unofficial) .. 1

CASSELL & CO.:—
Walker .... Surgical Diseases and Injuries of Genito-Urinary Organs Cover 1

CHURCHILL, J. & A.:—
Thorpe, Bezly .... Schott Methods of the Treatment of Chronic Diseases of the Heart ..... 4

FROWDE AND HODDER & STOUGHTON:—
McCann .. Cancer of the Womb: Its Symptoms, Diagnosis, Prognosis, & Treatment .. Cover 1
Waring .... Surgical Diseases of the Gall Bladder, Bile Ducts, & Liver Cover 1

GLAISHER:—
West ..... Granular Kidney and Physiological Albuminuria ..... 6

LEWIS & CO.—
De Swietochowski .. Mechano-Therapeutics in General Practice ..... 3
Kanthack .. The Preservation of Infant Life ..... 3
Kenwood .. Public Health Laboratory Work..... 3

LEWIS & CO.—(Continued).
Lewers .... The Diseases of Women. A Practical Text-book .... 3
Moullin .... Enlargement of the Prostate .... Cover 1
Murrell .... What to Do in Cases of Poisoning..... 3
Parkes & Kenwood . Hygiene and Public Health..... 3
Phillips .... Amœbiasis and the Dysenteries ..... 3
Rawling .... Landmarks and Surface Markings of the Human Body .. 3
Starr ..... The Adolescent Period: its Features and Management .. 3
" ..... Hygiene of the Nursery ..... 3
Stoddart .. Mind and its Disorders ..... 3

LONGMANS, GREEN & CO.:—
Gaskell .... The Involuntary Nervous System Cover 1
Schäfer .... The Endocrine Organs Cover 1

MEDICAL PUBLISHING CO.:—
Lane, Sir A. .... Operative Treatment of Fractures ..... 6

MURRAY:—
Brunton, Sir L. .... Therapeutics of the Circulation ..... 6

PULMAN & SONS:—
Elliot ..... Sclero-Corneal Trephining in the Operative Treatment of Glaucoma ..... 4

SAUNDERS COMPANY:—
Anders & Boston .. Medical Diagnosis .. 5
Anders & Boston's Medical Diagnosis ..... Cover 1
Coolidge .. Nose and Throat .... 5
Gant ..... On Diarrhœas ..... 5
Pilcher .... Cystoscopy ..... 5

WRIGHT & SONS (Bristol):—
Groves .... Modern Methods of Treating Fractures Cover 1

MEDICAL LIBRARIES, &c.:—
Baker, Birmingham—Books ..... 6
Behnke—Stammering, Lisping, and Cleft-Palate Speech ..... 4
British Commercial Gas Association—A Thousand and One Uses for Gas ..... 13
Ketley—Stammering ..... 4
Lewis & Co.'s Medical & Scientific Circulating Library..... 6
Matthews—Wood: Application of Trusses to Hernia ..... 4
Squire's Pocket Companion to the British Pharmacopœia, 1914 ..... Cover


## OFFICIAL AND GENERAL ANNOUNCEMENTS


APPOINTMENTS VACANT:—
Birmingham General Dispensary. 47
Birmingham and Midland Eye Hospital ..... 47
Bristol General Hospital..... 48
Bristol Royal Infirmary ..... 48
Bury Infirmary ..... 47
Cambridgeshire Asylum, Fulbourn ..... 47
Chesterfield and North Derbyshire Hospital ..... 47
County Asylum, Lancaster..... 48
Derbyshire Royal Infirmary ..... 48
Doncaster Royal Infirmary and Dispensary ..... 47
Elder Dempster & Co., Liverpool.. 48
Guest Hospital, Dudley ..... 46
Hatfield Military Hospital, Liverpool ..... 48
Hon Secretary, Tulse-hill ..... 48
Hospital for Consumption, &c., Brompton ..... 47
Jessop Hospital for Women, Sheffield ..... 47
Leeds Public Dispensary ..... 48
London Hospital ..... 48
London Temperance Hospital, Hampstead-road ..... 46
New Hospital for Women, Euston-road ..... 47
Northampton General Hospital .. 47
Putney Hospital ..... 48
Queen's Hospital for Children, Bethnal Green ..... 46
Royal College of Surgeons of England ..... 47
Royal Devon and Exeter Hospital ..... 48
Royal Free Hospital, Gray's Inn-road ..... 47
Royal Hampshire County Hospital, Winchester ..... 47
Royal Infirmary, Sheffield ..... 46
Sheffield Royal Hospital ..... 47
Southampton Free Eye Hospital.. 48
Throat Hospital, Golden-square.. 47
Victoria Hospital, Burnley..... 46
Victoria Hospital for Children, Chelsea ..... 47
Warwickshire and Coventry Joint Committee on Tuberculosis ... 47
Westmorland Consumption Sanatorium, &c., Grange-over-Sands.. 48

ASSISTANCIES, MEDICAL:—
Arnold & Sons, Giltspur-street .. 48
Fox, Combwich ..... 48
Freedman, Clapton..... 48
Howard, Yelverton ..... 48
Medical, Charlotte-street ..... 48
Medico, Oxford ..... 48
Miss S., Sandgate..... 48
No. 757, L.O., Strand ..... 48
Richardson, Isle of Man ..... 48
Turner, Adam-street ..... 44

ASYLUMS, HOMES, &c.:—
Abbotswood House, Cinderford .. 43
Ashwood House, Kingswinford .. 45
Barnwood House Hospital ..... 41
Bishopstone House, Bedford..... 40
Brunton House, Lancaster ..... 43
Buntingford House Retreat, Buntingford ..... 47
Camberwell House, Peckham-road 42
Capel Lodge Retreat and Sanatorium, near Folkestone ..... 43
Cheadle Royal..... 41
Clarence House, North Finchley.. 48
Clarence Lodge, Clapham Park .. 45
Colthurst House School, Alderley Edge ..... 40
Copples, The, Nottingham ..... 41
Dalrymple House, Rickmansworth 43
Dartmoor Sanatorium ..... 43
David Lewis Colony, Alderley Edge ..... 40
Duff House, Banff ..... 41
Edgar Allen Institute, Sheffield .. 44
Faraday House, Chapham Common..... 41
Ghyllwoods ..... 45
Grove House, Church Stretton..... 41
Grove, The, Catton, Norwich..... 41
Haslemere Nursing Home ..... 46
Haydock Lodge, Newton-le-Willows ..... 42
Heigham Hall, Norwich ..... 41
Home for Epileptics, Maghull .... 40
Invernith Sanatorium, Colinsburgh ..... 42
Littleton Hall, Brentwood ..... 45
London Fever Hospital..... 41
Malling Place, Kent ..... 41
Melbourne House, Leicester ..... 44
Mendip Hills Sanatorium ..... 44
Moat House, Tamworth ..... 41
Newmains Retreat, Lanarkshire.. 44
Nordrach-on-Dee, Banchory ..... 44
Northumberland House, Finsbury Park ..... 45
Northwoods House, Winterbourne 42
No. 381, L.O., Strand ..... 46
No. 412, L.O., Strand ..... 48
Peckham House..... 42
Pendyffryn Hall Sanatorium, Nordrach-in-Wales ..... 43
Plympton House, Plympton ..... 41
Portsmouth Corporation Mental Hospital ..... 40
St. Andrew's Hospital, Dollis Hill ..... 46
St. Andrew's Hospital, Northampton ..... 41
St. Luke's Hospital for Mental Diseases ..... 45
Shaftesbury House, Formby-by-the-Sea ..... 42
Springfield House Private Asylum, Bedford ..... 45
Stretton House, Church Stretton.. 41

ASYLUMS—(Continued).
The General Manager, Cravenstreet ..... 48
The Grange, near Rotherham .... 41
Vale of Clwyd Sanatorium ..... 44
Warneford Asylum, Oxford..... 45
Westcroft, Ilkley ..... 46
Woodfield, Streatham ..... 45
Wve House, Buxton ..... 41

HEALTH RESORTS, BATHS, &c.:—
Peebles Hotel Hydro..... 45
Smedley's, Matlock..... 45
Woodhall Spa ..... 41

HOMES WANTED:—
No. 814, L.O., Strand ..... 49

HOUSE & ESTATE AGENTS:—
Owner, Cricklewood ..... 49
CONSULTING ROOMS:—
W. S., Piccadilly ..... 49

LIFE & FIRE ASSURANCES, &c.:—
Prudential ..... 38

MASSAGE:—
Associated Male Nurses and Masseurs ..... 40
G., Highgate ..... 49
National Institute for the Blind.. 48

MEDICAL ACCOUNTANTS, &c.:—
Turner ..... 49

MEDICAL AGENTS:—
Fieldhall, Limited..... 44
Manchester Clerical, &c., Association ..... 49
Medical Agency ..... 49
Moore & Co. ..... 48
Needes, J. C. ..... 49
Peacock & Hadley..... 49
Turner ..... 49

MEDICAL SCHOOLS:—
(LONDON.)
Charing Cross Hospital Medical School ..... 38
Guy's Hospital ..... 34
London School of Clinical Medicine ..... 38
St. Mary's Hospital Medical School ..... 39
West London Post-Graduate College ..... 38
(PROVINCIAL, &C.)
University of Aberdeen..... 37
University of Birmingham ..... 37
University of Durham College of Medicine, Newcastle-upon-Tyne 37

NURSING INSTITUTES:—
Co-operation of Temperance Male and Female Nurses ..... 34
General Nursing Association..... 40
Hospital for Sick Children, Great Ormond-street ..... 40
London Nurses' Association ..... 34
London Temperance Nurses Co operation ..... 34
Male Nurses Temperance Co-operation..... 40
Mental Nurses Association ..... 40
Mental Nurses' Co-operation..... 40
New Mental Nurses' Co-operation ..... 40
Nurses' Association, York-street.. 40
Nurses' Co-operation, Portland-place ..... 34
St. Bartholomew's Hosp. Trained Nurses' Institution ..... 40
St. John's House ..... 40
St. Luke's Hospital, E.C..... 34
Temperance Association of Male Nurses, Ltd..... 34
Temperance Male Nurses Co-operation ..... 34
The Retreat, York ..... 34

OFFICIAL NOTICES:—
City of London Lying-in Hospital ..... 34
Federation of University Women 37
Guy's Hospital ..... 38
London School of Tropical Medicine ..... 37
Queen Charlotte's Lying-in Hospital ..... 34
Royal College of Physicians of London ..... 34
University of Cambridge..... 37
York-road General Lying-in Hospital, Lambeth ..... 34

PARTNERSHIPS & PRACTICES:—
Arnold & Sons, Giltspur-street.... 44
Lee & Martin, Birmingham ..... 48
No. 802, L.O., Strand ..... 49
No. 807, L.O., Strand ..... 49
No. 811, L.O., Strand ..... 49
No. 812, L.O., Strand ..... 49
Storey, Craven-street ..... 44
Turner, Adam-street ..... 48

RAILWAY & STEAMSHIP CO.'S.:—
New Zealand Shipping Co..... 34

SCHOOLS, PREPARATORY, &c.—
Paton, Cannon-street..... 38

TUTORS & LECTURERS:—
Behnke ..... 34
Schneile—Stammering ..... 4


*For Index to Trade and Miscellaneous Advertisements see page 4.*

# A Report
ON
# THE USE OF STOCK VACCINE IN INFECTION BY THE BACILLUS TYPHOSUS.
## WITH AN ANALYSIS OF 230 CASES.

BY T. H. WHITTINGTON, M.D. LOND.,
CAPTAIN, R.A.M.C. (T.C.)

THE 230 cases under consideration were in hospital during the winter 1914–15. Half the cases were in my medical charge, the remainder being in the wards of Major D. P. Johnstone, Captain J. A. Torrens, Captain G. D. H. Wallace, and other medical officers. Careful notes were taken and a summary of each case was made at its termination by the particular medical officer, and I am much indebted to them.

*Methods Adopted in the Investigation.*

The notes of the cases were made on the same plan, which was carried out with various modifications by the other officers. At the end of the winter, with the cases fresh in mind, an analysis was made of my series. About 500 cases of the enteric group have now passed through my wards, and after this additional clinical experience an attempt has been made to judge the effects of vaccine and to reconsider all the typhoid cases which have had this treatment.

To be certain of the effects of vaccine in any particular case is a difficult matter, as mere impressions in isolated cases often prove false. Vaccine given to a patient in the hope that it will do good is liable to get the credit of his excellent recovery, when there is no actual proof that he would not have done equally well without it. How, then, is one to judge the effects? It is obvious that even if a scientifically accurate method were available carefully selected controls are necessary, and that impressions have to be checked by a comparison between the vaccinated cases and the unvaccinated controls, and that *groups* of the same kind of case should be compared with other control groups.

Altogether 176 cases have had vaccine treatment. The cases now considered number 230; half of these were on vaccine treatment and the other 115 are the selected controls. To make a just comparison between the two sets of cases has been the object of this investigation. The analysis of the cases incidentally shows what were the usual course and complications of the disease among the soldiers in this hospital during the winter 1914–15.

*The selection of the cases.*—In order that cases of typhoid may be rightly compared they must conform to certain standards. It was by a rigid conformity to these standards that the cases were reduced in number to 230. First, it must be certain that all the cases are *true* typhoid and not merely due to one or other of the three organisms of the enteric group. For this reason neither the expression "typhoid fever" nor "enteric fever" was used in the title of this paper, as both these terms are often applied clinically to any case of the enteric group. Paratyphoid is, in the great majority of cases, a much milder disease than typhoid, the average prognosis being better in every way and the death-rate much lower.[1] In the early days of this hospital there had not been time or material to put the laboratory into proper working order. Many cases, therefore, were considered "typhoid fever" on clinical grounds or after the isolation from them of a Gram-negative motile bacillus which did not ferment lactose. Several such cases were treated with vaccine, and, making a good and rapid recovery, were considered at the time good results for this treatment. Further investigation of the organisms from some of these patients proved that the disease had been paratyphoid, and, as one came to recognise the usual course of this disease it was seen that these so-called good results were fallacies (see Case 0).

It is with this memory of some of our earlier mistakes that I place the bacteriological proof of the cases as the first essential. The hospital has been most fortunate in having several bacteriologists thoroughly acquainted with the bacilli of the enteric group. It is especially due to the work of Captain J. L. Wood, R.A.M.C., and of Captain W. H. Tytler, C.A.M.C., that the cultures of the organisms obtained from the cases are now in the laboratory, each indexed with a full account of their reactions and of the stringent standards to which they had to conform before being finally named. An analysis would have been useless without this sure foundation of the accurate bacteriological diagnosis of the cases. Of the 230 cases, 205 had the bacillus typhosus isolated from them. Of these, 177 were isolated from the blood stream, 20 from the stools, and 8 from the urine. In 43 of the fatal cases a post-mortem examination was made, and in 26 of the cases B. typhosus was isolated from the gall-bladder, and in 8 from the spleen. The remaining 25 cases, from which the organism was not isolated, were identified by the fact that their serum agglutinated B. typhosus before vaccine was given, and as all were uninoculated this seems sufficient. All cases in which the laboratory evidence was incomplete or equivocal or suggested a double infection have been excluded. Cases sent in as bacteriologically diagnosed "enteric" or "typhoid" are not necessarily included, as often all that was meant was that one of the organisms of the enteric series had been isolated.

*The state of inoculation* complicates the question of typhoid among soldiers. One cannot properly compare the effect of vaccine in unprotected cases with that in cases which already have had some variable amount of protection given them by the use of the same vaccine. Also serious cases are rare among inoculated men, and thus only a few inoculated cases have been treated by vaccine at this hospital. For these reasons I have paid special attention to the uninoculated cases. Of the series, 200 are of this kind—100 treated with vaccine and 100 unvaccinated controls. A few cases have been included in which the protective inoculation was given during the apparent onset of the disease (Case 164).

The varying severity of the disease in individuals and the fact that some cases come under treatment late and others early in the course of their fever make comparisons difficult. In analysing the cases I have divided them into classes according to their apparent severity at the time of admission and into groups according to the prognosis. Similar classes and groups of cases can then be compared according as they have or have not been on vaccine treatment. It is well known that typhoid varies not only in its incidence but also in its severity according to the year and season of the year, the climate and

[1] Torrens and Whittington: The Clinical Aspects of Paratyphoid Fever, Brit. Med. Jour., Nov. 13th, 1915, and Journal of the R.A.M.C., October, 1915.

locality, and the age and sex, and that the incidence of the complications is much affected by these factors. To judge the results of a method of treatment of any infectious disease, but especially of typhoid, the above conditions should be constant. The cases now considered occurred between November and May, the great majority during the months of December to March inclusive. They came from the comparatively small area occupied at the time by the troops of the Expeditionary Force. Finally, the patients all being soldiers, age and previous health were fairly constant. In this connexion it should be remembered that lack of care early in the disease increases the severity and mortality rate.

To sum up, in judging the effect of vaccine in typhoid cases I have tried to be certain of the following essentials (without which results will be fallacious): 1. Proof of infection by B. typhosus in all the cases, including the controls. 2. Accurate selection of these control cases—that is, (*a*) as far as possible the classes of cases and groups of cases compared are of the same degree of severity; (*b*) there is the same state (or lack) of inoculation in the cases compared; (*c*) all the cases occurred in the same season of the year and in the same climate and locality; (*d*) all were of the same sex and of about the same age and previous health; and (*e*) other modes of treatment (nursing, dieting, &c.) were similar.

*Clinical grouping of the cases.*—The classes referred to, into which the 230 cases were divided, varied according to the apparent condition of the patient on admission or after a day or two of observation, each class of vaccinated cases having a control class of the same size. It should be noted that the final result of the case was not taken into account, but the state of the case before treatment was started. I will briefly explain the method of this classification. A flushed, drowsy patient obviously ill is said to be looking "toxic" (Cases 8, 112, 162, &c.), and this expression is used by all the medical officers in describing their cases. For instance, a patient who has a typical typhoid aspect with a sallow, muddy complexion and malar flush, who is lying inert on his back, mentally fuddled or delirious and looking obviously poisoned, is described as "very toxic," whereas an alert mentally clear man merely looking slightly febrile is described as "quite non-toxic." The severity of the case usually, but by no means always, varies directly with the degree of toxæmia thus evident. In judging the severity the following points were especially considered: (*a*) The rate and type of the pulse; (*b*) the amount of pulmonary involvement; (*c*) the temperature; (*d*) the amount of distension; and (*e*) the day of the disease. The day of disease is counted from the day which appeared by the previous history to be the first day of illness. On these lines the 230 cases were divided into—

| | | | |
|---|---|---|---|
| Class 1 ... | 32 | cases, | very severe and very toxic. |
| ,, 2 ... | 86 | ,, | severe and toxic. |
| ,, 3 ... | 56 | ,, | of moderate severity. |
| ,, 4 ... | 44 | ,, | moderately severe, but quite non-toxic. |
| ,, 5 ... | 12 | ,, | mild. |

*The vaccine and dosage.*—The vaccine used (with 4 exceptions) was the stock army vaccine, made up for treatment purposes in the dilution of 250 millions to the c.c. The other 4 cases had a sensitised vaccine. The initial dose, the interval between the doses, and the rate of increase of the dose were all the subject of careful trial. In many of the earlier cases I had the great benefit of Sir William Leishman's advice and guidance. A small initial dose of 80–100 millions was tried in certain cases, but this did not seem sufficiently strong. There were some patients who had received their first inoculation during or immediately before the apparent onset of the disease (Case 164), and who were therefore considered to have had a big dose of vaccine (500 or 1000 millions) early in their attack. Some of these patients did unusually well, and therefore a similar big initial dose was tried in other cases (Case 162). Also these and other cases seemed to support the view that the sooner the vaccine was given the better was its chance of doing good, but later there were some cases of this variety which did badly. At one time we had the impression that it was very important to inject vaccine early, but perhaps this was due to the obvious fact that the sooner any case comes under ordinary treatment (bed, nursing, and dieting) the better chance has that patient of doing well. Eventually a first dose of 200–250 millions was usually given as a routine, and subsequent doses were usually injected at intervals of 2–3 days, rising by about 100–200 millions each time to 500 or 600 millions. The time of day for injection was varied. In nearly all cases I gave my patients their injections between 5 and 7.30 P.M. —i.e., when the temperature was usually rising. The other medical officers gave the injections during the morning when the temperature was down or falling. It was thought that as there is frequently a decided difference in the temperature and state of the patient as observed in the morning and in the evening, the time of day might be important, but the result did not support this view. It seemed both impossible and unwise to keep to any strict rule, and the system of dosage varied much with the individual case. If there was much local reaction or if there appeared to be a marked general reaction there was no increase of dose, or the increase was more gradual. Also if there was no local reaction and apparently no general reaction a bigger dose was often given the next day.

To be certain that a general reaction to the vaccine has occurred at any particular time in the course of a case is most difficult. All the medical officers here, after observing a large number of cases, eventually came to the conclusion that the temperature chart was a fallacious guide to the effect of any particular dose. In this matter I am unable to follow those who have described cases of typhoid in which rises and falls in the temperature were stated with assurance to have been due to the vaccine. Many of the control cases would have been considered good results for vaccine had they received it (Case 23).

### *Results in the Whole Series.*

The total *mortality* in the 230 cases (115 vaccinated, 115 selected controls) was 52 (22·6 per cent.), this being made up by 29 deaths in the vaccinated cases (25 per cent.) and 23 deaths in the unvaccinated (20 per cent.).

The average *length of the primary period of pyrexia* (neglecting fatal cases) was 27·5 days. The average date on which the temperature settled was the twenty-ninth day in the vaccinated cases and the twenty-sixth day in the controls.

The total number of cases having a *relapse* was 22 (9·5 per cent.), and of these 12 occurred among the vaccinated and 10 among the unvaccinated. In this investigation a relapse was taken to mean a rise of temperature lasting several days during which there was some recurrence of the previous

typhoid symptoms and signs. Rises of temperature due only to a complication or sequela are not included.

The total number of patients with *complications or sequelæ* of some kind or another was 111, and of these 58 were among those who had vaccine and 53 among the unvaccinated. The more important of these complications were distributed as follows:—

| Total 230 cases. | | Vaccinated. | Controls. |
|---|---|---|---|
| Hæmorrhage | 30 (13 %) | 17 (14·7 %) | 13 (11·2 %). |
| Perforation | 7 ( 3 %) | 5 ( 4·3 %) | 2 ( 1·7 %). |
| Thrombosis and phlebitis | 7 ( 3 %) | 4 ( 3·4 %) | 3 ( 2·6 %). |
| Severe post-typhoid debility or prolonged convalescence | 33 (14 %) | 19 (15·7 %) | 14 ( 12 %). |

"Hæmorrhage" does not include the fairly numerous cases in which only streaks of blood or minute quantities were present in the stools. Hæmorrhage from the bowel was the cause of death or the deciding factor in 6 of the fatal vaccinated cases and in 5 of the controls. It was noted that in some of the cases the hæmorrhage started just after a dose of vaccine or recurred after a dose (see Cases 162 and 164). Such cases may have been coincidences, like many other things, good and bad, which occur during vaccine treatment. There is, however, the possibility that after a dose of vaccine greater inflammatory reaction may occur in the ulcerated Peyer's patches, and the increase in the local blood pressure then occurring at these spots may be the decisive cause of the bleeding.

*Pulmonary involvement* and *meteorism* are not in the above list as, except in the mildest cases, there is always more or less chest trouble and more or less abdominal distension and it has seemed difficult to say at what stage conditions so frequently present become complications and are no longer to be considered part of the usual course of the disease. It seems certain, however, that vaccine has no power to prevent or to produce them, or to diminish them when present except in so far as it may affect the general health of the patient. The presence or absence of these conditions was always carefully noted in attempting to judge the effect of vaccine, and the vaccine rarely seemed to have any good effect in cases with much bronchitis or bronchopneumonia.

*Note.*—It must be remembered that (*a*) this high death-rate is the rate for a particular set of picked cases; (*b*) that 200 of the cases were uninoculated, that they occurred during the winter months, and many of them under adverse conditions unavoidable at that time (slow evacuation to fever hospitals, &c.); and (*c*) that 177 of them had B. typhosus isolated from the blood stream, and were therefore very definitely infected.

The death-rate for the hospital of the true typhoid cases was 12·4 per cent., being made up of a rate of 16·5 per cent. in the uninoculated and 8·1 per cent. in the inoculated up to November, 1915.

### *Results in the Uninoculated Cases.*

In the 200 uninoculated cases (100 on vaccine and 100 controls) the following are the results:—

| The 200 cases. | | Vaccine series. | Controls |
|---|---|---|---|
| Mortality | 47 | 25% | 22% |
| Average length of pyrexia in days | 27·5 | 29·4 | 26 |
| Cases with relapses | 19 | 10% | 9% |
| Cases with complications or sequelæ | 101 | 51 | 50 |

These results require a close analysis to show how the various types of case were affected. The classes will now be dealt with separately. (For Summary see Table I.)

*Class 1. Very severe and toxic.*—28 cases (14 with vaccine and 14 without).

(*a*) *Among the vaccinated cases* there were 9 deaths (64·2 per cent.) and 5 recoveries. Of the fatal cases, 5 died of toxæmia and cardiac failure with basal congestion and broncho-pneumonia in varying degrees 7, 3, 11, 5, and 7 days after

TABLE I.—*200 Uninoculated Cases: Statistics of the Five Classes, with and without Vaccine, and of the total 200.*

| — | Class 1. | | Class 2. | | Class 3. | | Class 4. | | Class 5. | | Percentage or average in | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Total 200. | 100 on vaccine | 100 no vaccine. |
| With (+) or without (0) vaccine | + | 0 | + | 0 | + | 0 | + | 0 | + | 0 | | + | 0 |
| Total number in class | 14 | 14 | 37 | 37 | 24 | 24 | 20 | 20 | 5 | 5 | 200 | 100 | 100 |
| Mortality | 9*a* | 10 | 15 | 10 | 1 | 2 | 1 | 0 | (1) | 0 | 23·5% | 25% | 22% |
| Length (days) of primary fever | 31 | 36 | 36·4 | 27·7 | 26·2 | 27·7 | 25·3 | 22·1 | 23·5 | 14·4 | 27·5 | 29 | 26 |
| Total number of cases having one or more complications of any kind, or sequelæ | 6 | 6 | 21 | 23 | 14 | 14 | 7 | 6 | 3 | 1 | 50·5% | 51% | 50% |
| Relapses | — | — | 3 | 3 | 4 | 4 | 2 | 2 | 1 | — | 9·5 | 10 | 9 |
| Hæmorrhage (1) | 2 | 1 | 9 | 6 | 2 | 3 | 2 | 1 | — | — | 12·5 | 15 | 10 |
| Perforation | 1 | 0 | 2 | 2 | — | — | — | — | — | — | 2·5 | 3 | 2 |
| Thrombosis | — | — | — | 1*b* | — | — | 1 | — | — | — | 1 | 1 | 1 |
| Phlebitis | — | — | 1 | — | 2 | 1 | — | — | — | — | 2 | 3 | 1 |
| Slight rises of temperature in convalescence (2) | 2 | 1 | 3 | 3 | 4 | 2 | 3 | 1 | — | 1 | 10 | 12 | 8 |
| Tachycardia in convalescence | 1 | 2 | 2 | 4 | 3 | 4 | 1 | 2 | 1 | 0 | 10 | 8 | 12 |
| Pleurisy | — | — | 1 | — | 1 | 1 | — | 2 | — | — | 2·5 | 2 | 3 |
| Otorrhœa | — | — | 1 | 1 | — | 1 | — | — | — | — | 1·5 | 1 | 2 |
| Marked wasting with bedsores | — | — | 3 | 1 | — | — | — | — | — | — | 2 | 3 | 1 |
| Parotitis | — | — | 1*c* | 4*d* | — | — | — | — | — | — | 2·5 | 1 | 4 |
| Laryngitis (3) | — | — | 1 | — | 1*e* | 1 | — | — | — | — | 1·5 | 2 | 1 |
| Other complications or sequelæ | 1 | 4*i* | 3 | 5*h* | 1*f* | 2*g* | — | 2 | — | 1 | 9·5 | 5 | 14 |
| Prolonged convalescence from severe debility and other causes not mentioned | 1 | 2 | 12 | 11 | 3 | 0 | 2 | 0 | — | — | 15·5 | 18 | 13 |

(1) Was the cause of or was associated with death in 6 vaccinated cases and 5 unvaccinated. (2) By this is meant evanescent rises of temperature which are not relapses and which are not associated with a complication or sequela. (3) Only cases in which there were destructive changes in the larynx are included (sore-throat, &c., not necessarily included). *a*. One death in a case admitted in a dying condition. *b*. The supposed cause of a pulmonary infarct (fatal). *c*. With abscess formation. *d*. Two with abscess and two without. *e*. Ulceration followed by cicatrisation requiring tracheotomy. *f*. Temporary insanity. *g*. Tonsillitis. *h*. Includes 1 case of biliary colic and jaundice. *i*. Includes 1 case of septicæmia and endocarditis (fatal) and 1 case of glomerular nephritis (fatal).

admission respectively. These cases in this order had 2, 1, 2, 3, and 2 injections of vaccine, and I doubt if it had any influence on them at all. Of the other 4 fatal cases, 1 got steadily worse and died of perforation 11 days after admission, and vaccine possibly did harm in this case. Perforation occurred the day after the second dose. Another case became steadily worse, having two severe hæmorrhages after the injection, and died 13 days after admission, and here also vaccine possibly did harm as the case was admitted early in its course and the bleeding occurred on the tenth and eleventh days. (See Case 162.) Another case died of hæmorrhage 36 hours after admission, having arrived in a collapsed condition as a result of severe bleeding during the journey. A small dose of vaccine (100 millions) was given after he had revived, and the hæmorrhage recurred. I do not think vaccine did him harm as no form of treatment could have saved him. In the remaining fatal case the temperature came down steadily after four doses of vaccine, but at the same time the pulse-rate and the delirium were bad, the patient was in a very asthenic condition, and he died 15 days after admission of a rapidly spreading pneumonia.

CHART 1 (Case 112).

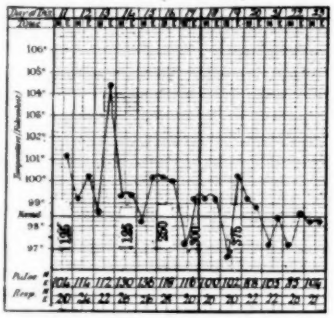
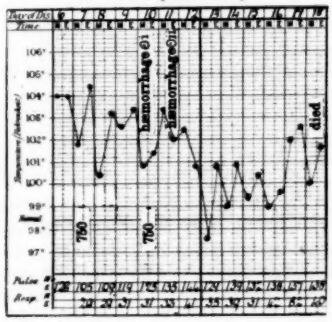
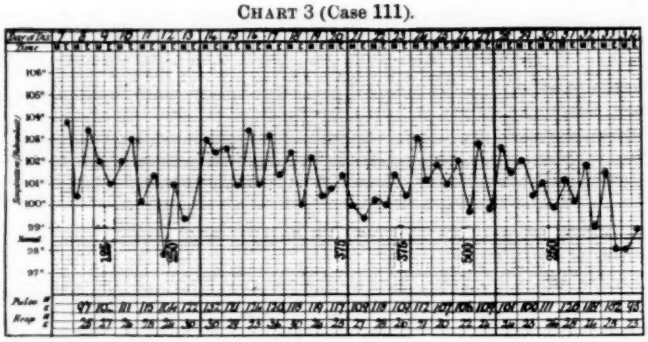


CHART 2 (Case 162).




Of the 5 survivors, in one vaccine certainly appeared to do good. This case is shown, and is one of those in which the temperature is no guide to the effect of vaccine (Case 112). In another the patient did not look as if he were going to pull through during his second week, but he began to get better after the third dose, and finally reached a normal temperature on the twenty-fourth day, which was rather soon considering the severity of the case. I think vaccine may have benefited him. The other 3 cases all ran a severe and long course, and all got rather worse after the first two or three doses of vaccine, and except for the fact that they did survive there is no reason to suppose that vaccine had a good effect, and one had a very tedious convalescence. One of these cases is shown together with a similar control case. (Case 111 and Case 8.) The average length of the primary fever in the 5 surviving cases was 31 days.

CHART 3 (Case 111).



(*b*) *Among the unvaccinated cases* there were 10 deaths (71·4 per cent.) and 4 recoveries. Of the fatal cases 6 died of toxæmia and cardiac failure with broncho-pneumonia 8, 6, 2, 6, 16, and 13 days after admission, living on the average three days longer than the 5 similar vaccine cases. The 4 other deaths were due respectively to (α) hæmorrhage, (β) acute glomerular nephritis, (γ) acute gangrenous decubitus and septicæmia coming on 21 days after admission, and lastly (δ) toxæmia associated with facial erysipelas.

The 4 surviving unvaccinated cases were all critically ill during their course. In the end 2 did very well and had an uninterrupted convalescence, and 1 of these (Case 8) is shown with a similar case on vaccine treatment (Case 111). The average length of the primary fever in the 4 surviving cases was 36 days.

**The effect of vaccine in this class may be summed up thus: In 1 case it certainly appeared to do good, and it may have done good in another. In 1 case it did not have a fair chance. In 1 case it appeared to do harm, and it possibly did harm in 2 others. In 4 it certainly did no good, and in the remaining 5 it cannot justly be said to have had an effect one way or the other. I do not think that a conclusion for or against should be drawn from a comparison of the mortality rates as the total number of cases was small, and in 2 of the non-vaccinated cases the cause of death was most unusual.**

### *Charts.*

*Note.*—All the cases shown are uninoculated patients unless otherwise stated. The average rates of pulse and respiration for the whole day are marked. The printed figures denote the dose of vaccine given in millions of bacilli.

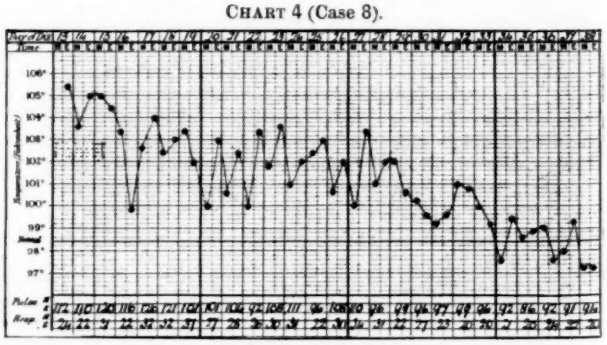
CASE 112 (Chart 1.)—On admission eleventh day: Sallow complexion with malar flush, toxic; dry furred tongue; regular pulse; abdomen distended and tender; feeble heart sounds; lungs normal. Fourteenth day: Rapid feeble pulse; bad sallow toxic look and muttering delirium. Twentieth day: Fall of temperature with profuse sweating; pulse now good; patient undistressed and sensible. Steadily improved from this day onwards.

*Summary.*—A very toxic severe case soon after admission (Class 1). Noticeable for quick improvement in mental symptoms and cardiac weakness. Apparently a good result for vaccine. Note entire absence of pulmonary involvement. Blood culture grew B. typhosus.

CASE 162 (Chart 2).—On admission sixth day: Flushed, lethargic, inert; typical appearance of acute toxic type with tendency to pseudo-pneumonic variety; small regular pulse; distended soft abdomen; diffuse coarse bronchitis. Blood culture grew B. typhosus. Ninth day: Voice lost; distension marked; bronchitis marked; general condition the same. Fifteenth day: Rapid poor pulse, mouth very dry, very toxic.

*Summary.*—A typical very severe toxic case (Class 1). Vaccine possibly did harm as patient got steadily more toxic. Pulmonary involvement became worse and he had two severe hæmorrhages in association with the injections.

CHART 4 (Case 8).



CASE 111 (Chart 3).—On admission seventh day: Pinched and flushed and looks ill, drowsy and cannot remember. Pulse regular but soft and dicrotic; tongue has dry brown

fur; abdomen full and moves badly; slight bronchitis. Blood culture grows B. typhosus. Thirteenth day: Toxic and drowsy; tongue still dry; pulse poor; more distended. Twenty-third day: Very drowsy; poor pulse, cardiac weakness the chief danger; more bronchitis. Twenty-ninth day: Poor pulse; slight but steady general improvement. Slow convalescence owing to dilated heart with rapid pulse.

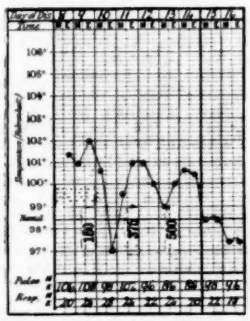
*Summary.*—Typical severe toxic and prolonged case (Class 1). Did not look like pulling through at one time. Vaccine not thought to have had any definite effect. Note rise in temperature and pulse-rate after second dose. Compare with Case 8.

CASE 8 (Chart 4).—On admission thirteenth day: Flushed, talks incoherently; pulse soft and thready; tongue dry and tremulous; abdomen distended and tender; much bronchitis. Blood culture grows B. typhosus. Eighteenth day: Better; bronchitis seems the chief danger. Twenty-sixth day: More toxic in appearance; stools frequent and undigested; pulse is steady and of better volume. Thirty-third day: No distension; pulse fair; does not look toxic. Slow steady improvement from now onwards.

*Summary.*—Very severe toxic and prolonged case (Class 1), which has done very well in the end without vaccine. Compare with Case 111.

CASE 0 (Chart A).—On admission eighth day: Looks ill and seems slightly delirious. Pulse of low tension but not dicrotic: abdomen distended and slightly tender; little or no bronchitis; spleen felt and large crop of large spots. Sent into hospital with culture from blood stated to be B. typhosus. Tenth day: Delirious; dry brown toxic tongue. Twelfth day: Improving; not delirious. Sixteenth day: Markedly improved all round; abdomen flaccid.

CHART A (Case 0).



*Summary.*—"A severe typical toxic case. Considered a good result for vaccine treatment, which markedly affected for the better both temperature and general condition." (Quoted from notes made at time of patient's discharge from hospital.) The culture obtained from blood was subsequently further examined and gave quite definitely all the cultural reactions of the B. paratyphosus A, and also fulfilled the agglutination and absorption tests. It is rather a characteristic of paratyphoid cases to take a sudden turn for the better a few days after admission. The supposed "good result," therefore, was a fallacy.

*Class 2. Severe and toxic.*—74 cases (37 treated with vaccine and 37 without).

(*a*) *Among the vaccinated cases* there were 13 deaths (35 per cent.) and 24 recoveries. In 6 of the *fatal cases* one is not justified in saying that vaccine affected the result. The causes of death in these 6 cases were as follows: Toxæmia and broncho-pneumonia in 3 cases; cellulitis and terminal septicæmia in 1 case; intestinal obstruction by adhesions resulting from a shut-off and healed perforation in 1 case; and lastly, toxæmia, with, in addition, ulceration of the vocal cords and epiglottis, in 1 case.

In 2 of the fatal cases vaccine certainly appeared to have a bad effect. In one of these (Case 159) the patient became worse in every way after four injections, and died on the seventeenth day after admission. In the other of these vaccine was given on the thirtieth day to see if it would stimulate the patient to finish off a long course, and this single dose was followed by fatal hæmorrhage (Case 164).

In the 5 remaining fatal cases there is a strong suspicion that the vaccine was harmful. In one the vaccine was given a good chance, as he had seven injections, but he slowly and steadily became worse, and finally perforated 22 days after admission. The second, who had five injections, died of toxæmia and pulmonary congestion 14 days after admission. The third died in three days of hæmorrhage commencing 36 hours after an injection of 250 millions. In the fourth case death occurred from toxæmia and broncho-pneumonia, but he had some hæmorrhage following on two doses of vaccine. The fifth of these cases died also of toxæmia and lung involvement, but he had become more delirious and altogether worse after two injections.

Of the 24 *recoveries*, 2 certainly appeared to have been benefited by the vaccine—that is to say, not only did they do well and quickly, but much more so than might have been expected considering their severe condition on admission (Case 117).

Another case appeared to have done unusually well, but had a severe relapse, and therefore cannot be considered a good result for vaccine. In 1, vaccine was only given in a relapse, and, as this was quite short, it may have done good in this way.

In four other cases it may possibly have been beneficial, as they all did fairly well and made a good convalescence. Eight of the cases ran a severe and rather long course, but this was no more than might have been expected and one cannot say that vaccine affected them one way or the other (Case 114 and Case 177). In 1 case the vaccine was stopped after two injections as the patient was doing badly owing to severe involvement of the lungs.

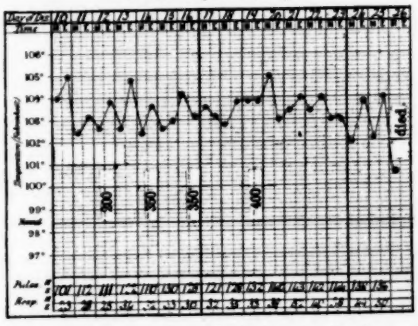
In 6 of the cases vaccine appeared to do harm, as although it was thoroughly tried, all these cases had long courses (two of over 80 days) which were associated with great weakness, wasting, and other complications. The average day of the disease on which the temperature first settled was the thirty-sixth, whereas in the controls it was the twenty-seventh day.

(*b*) In the *non-vaccinated* cases there were 10 deaths (27 per cent.) and 27 recoveries. Six of the fatal cases died of toxæmia and broncho-pneumonia, with a course similar to that of the vaccinated cases of this type. One of the 6 had a severe and one a slight hæmorrhage. Two cases died of perforation. In one of these the perforation did not occur till about the seventh week of the disease, and the other one had a hæmorrhage preceding the perforation. One case which had suppurating parotitis died of a confluent broncho-pneumonia. The remaining fatal case had thrombosis of the left femoral and external iliac vein and finally died as the result of pulmonary infarct and pleurisy.

Of the 27 recoveries, 10 ran the usual course of such cases, nearly all of these making a good convalescence. Two cases did remarkably well considering their apparent severity on admission. These cases are shown, as had they been given vaccine they would have appeared good results for this treatment (Cases 32 and 23). Two cases ran a course worse than the average, one being very prolonged and complicated by hæmorrhage, parotitis, and pyelitis, and the other was prolonged for six weeks but without complications. Of the remainder, 6 patients did rather better than usual and had no complications or sequelæ, whereas 8 others did rather worse than usual and all had one or more complications.

***Summary of this class.*—I wish to draw particular attention to this class as a test of vaccine, because, whereas in Class 1 the prognosis is bad, and in Classes 3, 4, and 5 fair to very good, it is in Class 2 that the prognosis is doubtful. It was hoped that in this class vaccine treatment might be found to turn the balance. It will be seen from the above analysis that this is not so. The mortality-rate is not lowered, neither is the incidence of relapses or complications lessened by this stock vaccine. Also the average cases which did well with vaccine ran a course very much the same as the average case which did well without it, and the cases which did exceptionally well in either group are balanced by such cases in the other. Finally, the average length of the primary period of pyrexia in the vaccine treated cases was longer by nine days than in those cases which had received no vaccine.**

CHART 5 (Case 159).




CASE 159 (Chart 5).—On admission tenth day: Looks toxic, but is quite sensible. Pulse soft and dicrotic; abdomen slightly distended and generally tender; bronchitis both bases. Blood culture = B. typhosus. Thirteenth day: Delirious; bases congested and broncho-pneumonia of influenzal type. Fifteenth day: Rigor followed vaccine. General condition is not so good, he is more delirious, and

abdomen is more distended. Twentieth day: Vaccine given at 7 P.M. last night. At 3 A.M. this morning much worse, temperature rose to 105° F., and pulse to 150. Is now very toxic with widely dilated pupils. Patient continued very toxic and finally died of exhaustion.

*Summary.*—A severe case (Class 2) which got decidedly more toxic while on vaccine. Vaccine certainly appeared to do harm, as patient was worse after each individual dose.

CHART 6 (Case 117).

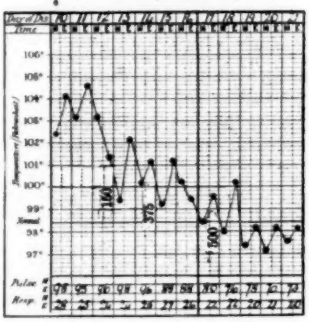
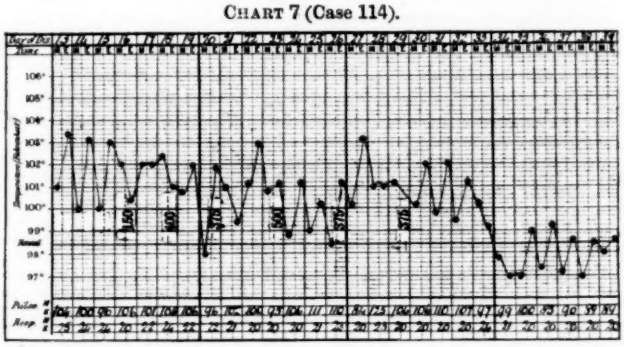


CHART 7 (Case 114).



CASE 117 (Chart 6).—On admission tenth day: Looks rather toxic, but mental condition is clear. Pulse is soft but not dicrotic; abdomen distended and slightly tender; heart sounds good; much big tube bronchitis. Thirteenth day: Toxic and delirious and trying to get out of bed. Blood culture = B. typhosus. Fifteenth day: Decidedly better; tongue moistening; profuse crop of spots all over body. Continued to make rapid progress.

*Summary.*—A rather severe and decidedly toxic case (Class 2) which has done remarkably well and rapidly and is apparently a good result for vaccine, but the absence of severe pulmonary involvement and the comparatively slow pulse throughout suggested a fairly good prognosis.

CASE 114 (Chart 7).—On admission thirteenth day: Mentally clear when roused. Small regular pulse; "beefy" tongue; abdomen not distended; spots are very numerous; no bronchitis. Blood culture = B. typhosus. Eighteenth day: Rapid, poor, irregular pulse; looks toxic. Twenty-first day: Pulse better; shows all-round improvement (? post or propter vaccine). Twenty-fifth day: General improvement continues, but temperature chart not affected. Thirtieth day: Continues doing well; quite undistressed; abdomen hollowed; temperature as before. Thirty-eighth day: Doing well, but looks pinched and is very wasted.

*Summary.*—A typical severe case (Class 2), marked by myocardial weakness. Final result good. There does not appear to be much evidence, however, that vaccine did any good. Case was prolonged and temperature was irregular

CHART 8 (Case 32).

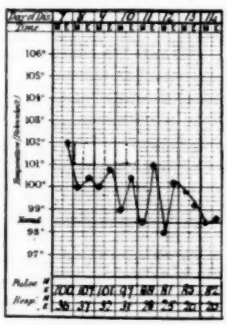
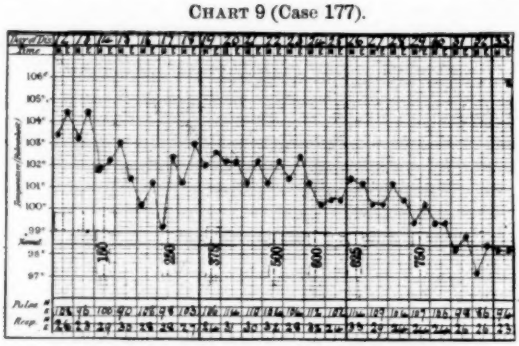


CHART 9 (Case 177).



independently of the vaccine. An example of several similar cases.

CASE 32 (Chart 8).—On admission seventh day: Toxic, flushed, incoherent, and later had muttering delirium. Regular, good pulse, not dicrotic; tongue is dry, with brown fur; abdomen full; respirations rapid, but no moist sounds in chest. Blood culture not done; Widal reaction = negative. Eighth day: Restless, delirious, and noisy; flushed and toxic. Tenth day: Remarkable change; no delirium; does not look toxic and is at his ease. Widal reaction = positive to B. typhosus. Patient went straight ahead to make an uninterrupted recovery.

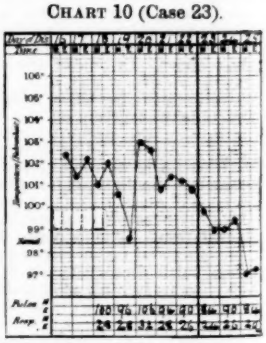
*Summary.*—Appeared a typical severe and very toxic case (Class 2). Made a remarkably good and rapid recovery. If vaccine had been given would undoubtedly have been thought a good result for this treatment, and the case, therefore, should be compared with No. 117 (Chart 6).

CASE 177 (Chart 9).—On admission fourteenth day: Flushed, toxic, and delirious, picking at bedclothes, and very talkative. Pulse is full and bounding, but dicrotic; tongue dry, brown fur; abdomen distended; coarse bronchitis. Blood culture negative; agglutination positive to B. typhosus. Eighteenth day: Flushed, still a little delirious; temperature fell, but general condition was not altered. Twenty-fourth day: Quieter the last few days and is now definitely improving. Thirtieth day: Slow improvement; mental condition poor, and he is frequently incontinent. Vaccine seems to have no effect; despite big dose there is no local or general reaction. Thirty-second day: Slow general improvement from now onwards, but mental condition did not recover for another ten days.

*Summary.*—A severe toxic case (Class 2) with mental weakness, pyrexia prolonged to end of fifth week. Ultimate result good. Had seven injections of vaccine which certainly did not shorten case, and it is doubtful whether vaccine had effect. Case is shown as an example of many similar cases which eventually did well but in which vaccine appeared to have no definite effect.

CASE 23 (Chart 10).—On admission eighteenth day: Flushed, looks toxic, laboured breathing; pulse of big volume but soft; abdomen not distended; no moist sounds, although slightly cyanosed and breathing deeply. Twenty-first day: Much better all round, and has lost his toxic look. Went ahead rapidly after this. Blood culture before admission reported as B. typhosus. Blood culture was negative here, but agglutination reactions strong with B. typhosus.

CHART 10 (Case 23).



*Summary.*—Typical toxic and apparently severe case (Class 2) on admission, which rapidly improved in an unexpected manner without vaccine and which made a rapid convalescence. Case is shown as an example of several which, if they had received vaccine, might have been thought good results.

*Classes 3 and 4. Moderately severe and slightly toxic or not toxic.*—88 cases (44 treated with vaccine and 44 without). These two classes of case are considered together, as they form degrees of the same kind of case in which the prognosis varies from "good" to "very good." It is especially in this class of case that a good effect of vaccine is difficult to judge, as all are likely to do well, and vaccine is therefore liable to get undeserved credit

**unless the unvaccinated controls are considered. The statistics of the control cases must be carefully examined (see Table I.), and it will then be seen that the effect of vaccine, in so far as it has a good influence, is practically negligible.**

(*a*) In 5 of the *vaccinated cases* there did certainly appear to be an effect on the case as a whole, and in 1 each injection seemed to have a marked effect (Case 124). But cases of a similar nature may occur without vaccine treatment. In 10 other cases vaccine may have shortened the fever, and therefore may have done good in these.

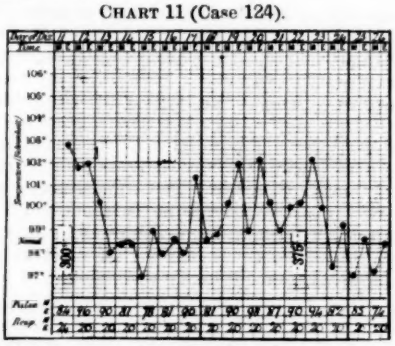
In 1 fatal case it certainly appeared to do harm, as this case was neither very severe nor toxic, and yet the patient got progressively worse while on vaccine and died of toxæmia and cardiac failure (Case 140). In the other fatal case which had vaccine death was due to sudden hæmorrhage on the seventeenth day of disease following on a dose of vaccine. There was, however, just such a case of fatal hæmorrhage occurring on the eighteenth day of disease in one of the controls. Vaccine may have been the decisive factor, but the hæmorrhage may thus have been a coincidence.

In 5 other cases the course was long or otherwise worse than the average, and vaccine may possibly have done harm to these. In the remaining 22 cases the patients did well, but just as might have been expected, and I do not think vaccine affected them either way.

(*b*) *In the 44 unvaccinated cases* there were also 2 deaths. One already referred to died of hæmorrhage, and the other also had hæmorrhage, but died with increasing severity and toxæmia.

The great majority of the cases ran the course that was expected. The average length of fever in the vaccinated and unvaccinated cases of these classes was about the same and is shown together with the incidence of complications and sequelæ in Table I.

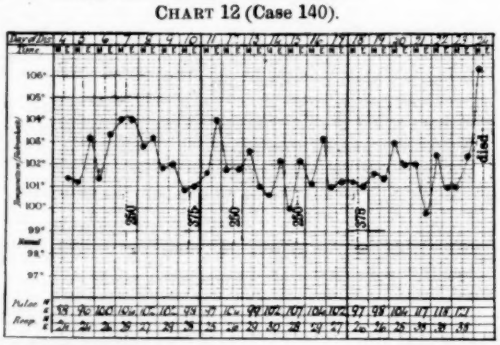
CHART 11 (Case 124).



CASE 124 (Chart 11).—On admission eleventh day: Sallow, with slight malar flush; lethargic, but clear mentally when roused. Regular, good volume, soft dicrotic pulse; normal abdomen and no moist sounds in chest. Blood culture negative; stool of thirteenth day grew B. typhosus.

*Summary.*—A case which looked moderately severe (Class 4), but with an excellent prognosis. Did very rapidly but had a relapse. Case is shown as one of the few in which each individual dose of vaccine appeared to have a marked effect both on temperature and general condition.

CHART 12 (Case 140).




CASE 140 (Chart 12).—On admission seventh day: Pale and looks ill; lethargic, but quite clear when roused; big volume, but very soft and dicrotic pulse; abdomen is not distended; no moist sounds heard in chest. Blood culture = B. typhosus. Fourteenth day: For the first few days was bright in the mornings and could read the paper. Is now getting a little more toxic; wanders at night; abdomen now tumid; pulse good and rarely above 100. Eighteenth day: Continues as above. Sleeping draught required at night. Tongue now quite dry and typical; pulse soft and dicrotic. Is now rather a severe case. Twentieth day: Very restless; is distended and has diarrhœa; heart is getting dilated. Twenty-third day: Heart shows cantering rhythm. Tubular breathing left lower lobe, but rapid respiration is mostly toxic. Seems to be going downhill with cardiac weakness associated with a steadily increasing and now severe toxæmia. Vaccine quite useless (? has increased toxæmia).

*Summary.*—A typical slightly toxic and moderately severe case (Class 3)—*vide* pulse-rate, respiration-rate, absence of distension, &c., on admission. Patient had the appearance of one likely to do well, and vaccine therefore undoubtedly appeared to do harm.

*Class 5. Very mild.*—10 cases (5 treated with and 5 without vaccine).

One death occurred in this class in a man who had a severe relapse (?) and prolonged fever, after what appeared to be a very mild preliminary attack. It was only when in this acute stage that he had vaccine and the death is therefore in brackets in the comparative tables. Two vaccinated cases ran an unusually long course, and it should be noted that the average length of fever in the vaccine-treated cases was much longer than in those who did not receive it. As the numbers are small one can only say that in this class the vaccine did not appear to have any good effect.

### *The Inoculated Cases.*

**There are 30 of these, half being treated with vaccine. They had all been inoculated once or twice during the nine months preceding their illness. B. typhosus was isolated from each. As the number in each series is small I do not think that much can be deduced from the statistics. The more important facts are set out in Table II.**

TABLE II.

| — | Class 1. | | Class 2. | | Class 3. | | Class 4. | | Class 5. | |
|---|---|---|---|---|---|---|---|---|---|---|
| With (+) or without (0) vaccine ... ... ... ... | + | 0 | + | 0 | + | 0 | + | 0 | + | 0 |
| Number of cases in class... | 2 | 2 | 6 | 6 | 4 | 4 | 2 | 2 | 1 | 1 |
| *Mortality ... ... ... ... | 2 | 0 | 2 | 1 | — | — | — | — | — | — |
| Average length of fever ... | — | 25·5 | 35 | 27 | 25 | 27 | 25 | 28 | 21 | 23 |
| Hæmorrhage ... ... ... | 1 | — | 1 | 1 | — | 1 | — | — | — | — |
| Perforation ... ... ... ... | 1 | — | 1 | — | — | — | — | — | — | — |
| Relapse... ... ... ... ... | 1 | — | — | — | 1 | — | — | — | — | — |
| Prolonged convalescence | — | 1 | — | — | 1 | — | — | — | — | — |
| Thrombosis ... ... ... ... | — | — | — | — | 1 | — | — | — | — | — |

**It will be seen that in the above 15 cases vaccine had no good effect on the mortality or on the incidence of complications. I do not think that one can say that it definitely had a bad effect on the cases as a whole as the numbers are small. One outstanding fact, however, is that the average length of fever amongst the vaccinated cases of Class 2 (the largest class) was much longer than that of those in this class who had no vaccine.**

*One of the cases of Class 1 which died was admitted in a critical condition with a subnormal temperature. He had one injection, after which the temperature steadily rose and he died 36 hours afterwards. In the other fatal case of this class the temperature took six weeks to reach normal; the patient then had a relapse, during which he died of perforation of an old ulcer. Of the 2 fatal vaccinated cases of Class 2, one died of perforation after three injections and the other died of a confluent broncho-pneumonia, being then in a very asthenic state with a subnormal temperature. There was no case among the series receiving vaccine which did markedly better than any of the control cases.

In none of the 4 cases which were given the *serum-treated vaccine* is there any reason to suppose that their course was definitely affected. One of the cases died of toxæmia. It was a severe prolonged case, and the serum-treated vaccine was given late in the disease to see if it could stimulate the patient to further efforts, but without effect.

### *Summary and Conclusions.*

**In the total vaccinated cases there were 29 in which it appeared that vaccine had a definite good influence. Of these, 20 belonged to Classes 3 and 4**

—i.e., to those classes in which the prognosis is good. In other words, "good results" are more often obtained where good results can be expected by ordinary methods of treatment alone. On the other hand, the mortality rate and the average length of fever in these classes were slightly worse among the cases who had vaccine.

Among the cases belonging to Classes 1 and 2 in which the vaccine appeared to do good none had severe lung involvement. Those cases which had much bronchitis or broncho-pneumonia (the average severe case) ran the severe course which is usual and vaccine appeared to be of no avail. To say that, if the average severity of the cases treated had been less the vaccine would have had better results, is merely to say, I think, that the cases would then have done better anyhow.

From all this it would appear (*a*) that it is in just those cases in which the physician so much requires help that vaccine is disappointing; (*b*) that vaccine neither shortens the fever nor reduces the number of complications in even that class of case which is likely to do well; and (*c*) that there is a decided suspicion that vaccine increases the incidence of hæmorrhage.

Therefore the conclusion is that the use of a stock vaccine in typhoid cannot be recommended as a routine treatment.

I should add that these conclusions are largely contrary to the impressions which I received during the treatment of the earlier cases. I had not then seen a sufficient number of similar cases which did well without vaccine, and being rather biassed in its favour I gave undeserved credit to this treatment.

## FURTHER REMARKS ON AGGLUTINATION TESTS IN INOCULATED PERSONS,

### AND THE INFLUENCE OF FEBRILE CONDITIONS ON INOCULATION AGGLUTININS.[1]

BY GEORGES DREYER, M.A. OXON., M.D. COPENHAGEN,
MAJOR, R.A.M.C.; PROFESSOR OF PATHOLOGY, UNIVERSITY OF OXFORD; FELLOW OF LINCOLN COLLEGE;

ALEX. G. GIBSON, M.D. OXON., F.R.C.P. LOND.,
CAPTAIN, R.A.M.C.; LECTURER IN MORBID ANATOMY, UNIVERSITY OF OXFORD; AND

E. W. AINLEY WALKER, M.A., M.D. OXON.,
LIEUTENANT, OXFORD UNIVERSITY O.T.C.; LECTURER IN PATHOLOGY, UNIVERSITY OF OXFORD; FELLOW AND TUTOR OF UNIVERSITY COLLEGE.

(*From the Department of Pathology, University of Oxford.*)

IN the course of the discussion on Paratyphoid Fever at the Royal Society of Medicine on Nov. 25th, 1915, Captain H. L. Tidy[2] made known certain conclusions which he had arrived at regarding the value of agglutination tests in typhoid and paratyphoid fevers and other febrile conditions. These conclusions were so completely divergent from previously established results that Dreyer and Torrens[3] at once briefly summarised in a letter to THE LANCET the mass of evidence then in their possession which showed the complete untenability of Tidy's views. Shortly afterwards Ainley Walker[4] dealt with the same contentions by showing that this marked discrepancy in results seemed only to be explicable by a recognition of the gross character of the fallacies inherent in the method used by Tidy.

In apparent ignorance of the emphatic contradictions of his statements regarding the influence of febrile conditions on inoculation agglutinins offered in these communications, Tidy repeated and amplified his conclusions in a recent issue of this journal[5] in a preliminary note on a report to the Medical Research Committee.

Unfortunately the matter cannot be allowed to rest here, for Tidy's conclusions would, if accepted, have a most disastrous effect upon diagnosis, and upon our estimate of the protective value of inoculation, since the vast majority of febrile affections occurring in persons inoculated within the preceding year would then necessarily be diagnosed as typhoid fever on the results of properly conducted agglutination tests. Fortunately, however, they can readily be shown to be entirely fallacious. Tidy's contentions are as follows:—

1. Inoculation agglutinins are diminished or entirely removed by febrile conditions. It is possible that they are converted into agglutinoids.
2. In certain cases they may return, but usually do not do so.
3. A positive agglutination reaction to B. typhosus after the fifth day of pyrexia has the same value in an inoculated as in an uninoculated person.
4. Immunity conferred by inoculation may be affected at the same time as the inoculation agglutinins.

The actual number of observations on which these conclusions are based cannot be ascertained from the note in question, beyond the fact that the material included only 14 cases of paratyphoid B fever, and 9 cases "of septic origin." The value of the results quoted in percentages is, therefore, necessarily doubtful.

In order to show the value of the claim that "inoculation agglutinins are diminished or entirely removed by febrile conditions," we may take first the figures published by Dreyer and Torrens for typhoid agglutination in inoculated subjects suffering from paratyphoid infection (171 cases), or from febrile conditions other than typhoid and paratyphoid fevers (97 cases), as contrasted with Tidy's figures.

TABLE I.—*Typhoid Agglutination in Cases of Paratyphoid Fever occurring in Typhoid-inoculated Persons.*

| Dreyer and Torrens (standard cultures). | | Tidy (microscopic method). | |
|---|---|---|---|
| Serum dilution in which agglutination occurred. 1 in— | Number of cases. | Agglutination recorded as— | Number of cases. |
| *250 or more ... ... | 157 | More than slight ... ... | 3 |
| 100–250 ... ... ... | 10 | Slight ... ... ... ... | 3 |
| 50–100 ... ... ... | 2 | Nil ... ... ... ... ... | 8 |
| 25–50 ... ... ... | 2 | | 14 |
| | 171 | | |

* In the majority of these the dilution was considerably greater than 1 in 1000.

TABLE II.—*Typhoid Agglutination in Cases of Febrile Affections other than Typhoid or Paratyphoid Fever occurring in Typhoid-inoculated Persons.*

| Dreyer and Torrens (standard cultures). | | Tidy (microscopic method). | |
|---|---|---|---|
| Serum dilution in which agglutination occurred. 1 in— | Number of cases. | Agglutination recorded as— | Number of cases. |
| 250 or more ... ... | 57 | In an unstated number of cases 16 per cent. gave a "distinct trace" of agglutination in 1 in 50. Among these were 9 cases of septic origin which gave:— | |
| 100–250 ... ... ... | 24 | | |
| 50–100 ... ... ... | 11 | | |
| 25–50 ... ... ... | 3 | | |
| Less than 25 ... | 2 | Nil 1 in 20 ... ... ... ... ... | 6 |
| | 97 | Not stated, but presumably more than 1 in 20 ... | 3 |

[1] Being a part of a report to the Medical Research Committee.
[2] THE LANCET, 1915, ii., 1191. [3] THE LANCET, 1915, ii., 1369.
[4] THE LANCET, 1916, i., 17.
[5] THE LANCET, 1916, i., 241.

Hitherto unpublished observations made in the Department of Pathology at Oxford by Dr. A. D. Gardner, Mr. Wilburt C. Davison, and ourselves give the same result as those published by Dreyer and Torrens. The figures are given in Table III.; they comprise 108 cases of febrile affections other than typhoid fever, in persons who had been inoculated against typhoid within the preceding 12 months. Of these cases 42 were cases of paratyphoid A fever, 33 were cases of paratyphoid B fever, and 33 were cases of "other pyrexial conditions" of a continued character.

To facilitate the survey of these results the agglutination titre is expressed not only in standard units, but also in the highest dilution in which agglutination occurred. The cases are arranged in order according to the number of standard agglutinin units in the serum. Five different standard agglutinable cultures were in use during the course of these investigations. Their respective reduction factors (i.e., relative sensitiveness to agglutination) were 4·0, 4·3, 4·7, 5·4, and 6·3. Accordingly, in order to arrive at a true comparison of agglutination titre, attention must be directed to the number of standard agglutinin units per c.c. of serum, which alone affords a true measure of the agglutinating power of any given serum. The importance of thus expressing results in standard agglutinin units is clearly seen from Table III., since with different standard agglutinable cultures agglutination in the same serum dilution does not necessarily imply the presence of the same number of standard agglutinin units in the serum. For owing to the different agglutinability of different cultures each standard agglutinable culture has its own particular reduction factor for calculating the number of standard agglutinin units in any given serum tested. The standard agglutinin unit is that amount of agglutinating serum which, when made up to 1 c.c. volume with normal saline solution, causes standard agglutination on being mixed with 1·5 c.c. of a particular standard agglutinable culture and maintained at 55° C. for two hours in a water bath followed by 15 to 30 minutes at the room temperature. Standard agglutination is the highest dilution in which a given serum causes marked agglutination (without sedimentation) visible to the naked eye. It follows from what has just been said that if standard agglutination occurs in a serum dilution of 1 in 1000, say, then 1000 divided by the reduction factor for the particular standard agglutinable culture employed gives the number of standard agglutinin units per c.c. of the serum.

From the extensive mass of evidence presented in Tables I. to III. it is obvious: 1. That the febrile condition associated with paratyphoid fever does *not* cause disappearance of typhoid agglutinins from the blood of persons inoculated against typhoid. 2. That "other febrile conditions" also, in so far as they have hitherto presented themselves, do *not* cause disappearance of typhoid agglutinins from the blood of inoculated persons. 3. That the statement that "a positive agglutination reaction to B. typhosus after the fifth day of pyrexia has the same value in an inoculated as in an uninoculated person" is entirely erroneous. Its acceptance would lead to such deplorable results in diagnosis that we feel compelled to repeat its categorical denial. For if Tidy's novel view were to be seriously applied in sero-diagnosis the great majority of persons inoculated within a year or so, who suffered from five days' pyrexia, would necessarily be returned as cases of typhoid infection when examined by a reliable agglutination technique.

TABLE III.—A. *Typhoid Agglutination in Cases of Paratyphoid A Fever occurring in Typhoid-inoculated Persons.*

| Number. | Case number. | Highest serum dilution in which agglutination occurred. 1 in— | Serum dilution in which standard agglutination occurred. 1 in— | Number of standard agglutinin units per c.c. of patient's serum. | Number. | Case number. | Highest serum dilution in which agglutination occurred. 1 in— | Serum dilution in which standard agglutination occurred. 1 in— | Number of standard agglutinin units per c.c. of patient's serum. |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 31 | 500 | 350 | 88 | 22 | 96 | 250 | 175 | 28 |
| 2 | 84 | ,, | ,, | 88 | 23 | 113 | ,, | ,, | 28 |
| 3 | 89 | ,, | ,, | 75 | 24 | 147 | ,, | ,, | 28 |
| 4 | 121 | ,, | ,, | 75 | 25 | 32 | 125 | 90 | 22 |
| 5 | 122 | ,, | ,, | 75 | 26 | 77 | ,, | ,, | 22 |
| 6 | 124 | ,, | ,, | 75 | 27 | 78 | ,, | ,, | 22 |
| 7 | 126 | ,, | ,, | 75 | 28 | 80 | ,, | ,, | 22 |
| 8 | 127 | ,, | ,, | 75 | 29 | 140 | ,, | ,, | 22 |
| 9 | 148 | ,, | ,, | 56 | 30 | 141 | ,, | ,, | 22 |
| 10 | 149 | ,, | ,, | 56 | 31 | 135 | ,, | ,, | 21 |
| 11 | 151 | ,, | ,, | 56 | 32 | 136 | ,, | ,, | 21 |
| 12 | 143 | 250 | 175 | 44 | 33 | 138 | ,, | ,, | 21 |
| 13 | 146 | ,, | ,, | 44 | 34 | 98 | ,, | ,, | 19 |
| 14 | 134 | ,, | ,, | 41 | 35 | 101 | ,, | ,, | 19 |
| 15 | 90 | ,, | ,, | 37 | 36 | 107 | ,, | ,, | 14 |
| 16 | 92 | ,, | ,, | 37 | 37 | 116 | ,, | ,, | 14 |
| 17 | 93 | ,, | ,, | 37 | 38 | 20 | 50 | 35 | 9 |
| 18 | 94 | ,, | ,, | 37 | 39 | 91 | ,, | ,, | 7 |
| 19 | 105 | ,, | ,, | 37 | 40 | 102 | ,, | ,, | 7 |
| 20 | 129 | ,, | ,, | 37 | 41 | 133 | ,, | ,, | 7 |
| 21 | 130 | ,, | ,, | 37 | 42 | 117 | ,, | ,, | 6 |

B. *Typhoid Agglutination in Cases of Paratyphoid B Fever occurring in Typhoid-inoculated Persons.*

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 24 | 5000 | 3500 | 875 | 18 | 42.d | 500 | 350 | 65 |
| 2 | 28 | ,, | ,, | 875 | 19 | 21 | 250 | 175 | 44 |
| 3 | 62.d | ,, | ,, | 650 | 20 | 29 | ,, | ,, | 44 |
| 4 | 69 | 2500 | 1750 | 438 | 21 | 33 | ,, | ,, | 44 |
| 5 | 19 | 1250 | 875 | 219 | 22 | 59 | ,, | ,, | 44 |
| 6 | 26 | ,, | ,, | 219 | 23 | 144 | ,, | ,, | 44 |
| 7 | 66 | ,, | ,, | 219 | 24 | 145 | ,, | ,, | 44 |
| 8 | 68.d | ,, | ,, | 162 | 25 | 150 | ,, | ,, | 44 |
| 9 | 56 | 500 | 350 | 88 | 26 | 128 | ,, | ,, | 37 |
| 10 | 57 | ,, | ,, | 88 | 27 | 115 | ,, | ,, | 28 |
| 11 | 65 | ,, | ,, | 88 | 28 | 15 | 125 | 90 | 22 |
| 12 | 70 | ,, | ,, | 88 | 29 | 22 | ,, | ,, | 22 |
| 13 | 72 | ,, | ,, | 88 | 30 | 132 | ,, | ,, | 21 |
| 14 | 74 | ,, | ,, | 88 | 31 | 103 | ,, | ,, | 19 |
| 15 | 79 | ,, | ,, | 88 | 32 | 73 | 50 | 35 | 9 |
| 16 | 120 | ,, | ,, | 75 | 33 | 118 | ,, | ,, | 6 |
| 17 | 125 | ,, | ,, | 75 | | | | | |

C. *Typhoid Agglutination in Cases of Other Febrile Conditions occurring in Typhoid-inoculated Persons.*

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 30 | 2500 | 1750 | 438 | 18 | 106 | 250 | 175 | 37 |
| 2 | 63 | ,, | ,, | 438 | 19 | 68 | 125 | 90 | 22 |
| 3 | 51.d | ,, | ,, | 325 | 20 | 18 | ,, | ,, | 22 |
| 4 | 27 | 1250 | 875 | 219 | 21 | 75 | ,, | ,, | 22 |
| 5 | 53.d | ,, | ,, | 162 | 22 | 83 | ,, | ,, | 22 |
| 6 | 34 | 500 | 350 | 88 | 23 | 137 | ,, | ,, | 21 |
| 7 | 58 | ,, | ,, | 88 | 24 | 100 | ,, | ,, | 19 |
| 8 | 119 | ,, | ,, | 75 | 25 | 58.d | ,, | ,, | 17 |
| 9 | 123 | ,, | ,, | 75 | 26 | 97 | ,, | ,, | 14 |
| 10 | 52.d | ,, | ,, | 65 | 27 | 114 | ,, | ,, | 14 |
| 11 | 61.d | ,, | ,, | 65 | 28 | 23 | 50 | 35 | 9 |
| 12 | 112 | ,, | ,, | 56 | 29 | 76 | ,, | ,, | 9 |
| 13 | 64 | 250 | 175 | 44 | 30 | 81 | ,, | ,, | 9 |
| 14 | 71 | ,, | ,, | 44 | 31 | 95 | ,, | ,, | 6 |
| 15 | 87 | ,, | ,, | 44 | 32 | 25 | <25 | <17·5 | <5 |
| 16 | 139 | ,, | ,, | 44 | 33 | 53 | ,, | ,, | <5 |
| 17 | 142 | ,, | ,, | 44 | | | | | |

On examining the new material presented in Table III. rather more closely it will be seen that in *only two* cases does the agglutination titre of the serum fall below 1 in 25, which represents in these cases less than 5 standard agglutinin units per c.c. of serum. But it has been found that the serum of normal non-inoculated persons who have not had typhoid fever only very exceptionally exhibits the presence of as much as 4 standard agglutinin units.[6] It follows that in no less than 106 out of the 108 febrile cases (i.e., 98 per cent.) the agglutinin titre is greater than can be expected to be found in normal non-inoculated individuals. Only in 2 cases (1·9 per cent.) does it fall as low as in the average normal non-inoculated person. And this percentage is not greater than has been found among a similar number of inoculated persons examined at similar intervals after their inoculation, who remained in normal health at the time of examination.

Of 42 cases of paratyphoid A fever recorded in Table III. no case exhibits an agglutinin titre of less than 6 units, which corresponded to agglutination in a dilution of 1 in 50. In the case of paratyphoid B fever the table shows again that of 33 cases no case exhibits an agglutinin titre of less than 6 units.

There are, however, other features of interest to be noted in the table. Thus, so far from paratyphoid fever diminishing the titre of typhoid agglutinins in the serum of inoculated persons, paratyphoid B fever commonly causes a rise in the typhoid agglutinin titre which is frequently of very considerable extent. In the case of paratyphoid A fever both the frequency with which this rise occurs and its extent are usually much less evident. Attention has already been drawn to these points in the Directions for the Use of Standard Agglutinable Cultures which, since the middle of July, 1915, have been issued from this Department on behalf of the Medical Research Committee along with every issue of the Standard Agglutinable Cultures themselves in the following terms:—

In the case of inoculated persons the diagnosis of active typhoid (or paratyphoid) infection will require two or more successive examinations of the serum.

(*a*) If the individual is suffering from active *typhoid* infection his titre of typhoid agglutination will exhibit the usual rise and subsequent regular fall seen in non-inoculated subjects, but starting from and returning towards the higher base line of inoculated persons.

(*b*) If the individual is suffering from active *paratyphoid* infection one of three things may occur as regards his *typhoid* agglutination titre—namely: (1) No appreciable change may occur in the titre of typhoid agglutination; (2) a relatively slight rise may occur, followed by a fall towards the former level; (3) a marked rise may occur synchronous with the rise in paratyphoid agglutination titre, and subsequently followed by the usual fall towards the former level. Meanwhile the titre of *paratyphoid* agglutination runs the normal course of rapid rise to a maximum (usually exceeding the maximum typhoid titre) followed by a fall, at first rapid and then slower as already described for typhoid subjects, and falling *below* the persistent base line of typhoid agglutination of inoculated persons.

In the present series of observations it will be seen that if a serum titre of 25 standard agglutinin units is chosen for purposes of comparison it is found that in the case of paratyphoid B fever (Table III., B) 27 patients out of 33—i.e., 81·9 per cent.—exhibited a titre of more than this number of units, while in the case of paratyphoid A fever (Table III., A) only 24 patients out of 42—i.e., 57·1 per cent.—had a titre exceeding 25 units, and in the case of "other febrile conditions" (Table III., C) only 18 patients out of 33—i.e., 54·5 per cent.—also had a titre exceeding 25 units. Thus it is obvious that the paratyphoid B cases show on an average a very much higher titre of typhoid agglutination than either of the other series. But there is also an indication that the paratyphoid A cases present a higher titre than the cases of "other febrile conditions." At the same time there is, as already remarked, no indication whatever that these other febrile conditions exhibit a lower titre than is met with in typhoid-inoculated healthy individuals examined at similar intervals after their protective inoculation.

As the results already recorded by Dreyer and Torrens and the new material here presented are entirely at variance with the assertions made by Tidy, we are compelled to conclude that his statement that of the two main techniques with regard to agglutination, microscopic and macroscopic, "they are both reliable, and for diagnostic purposes no further elaboration is necessary beyond the ordinary well-recognised precautions described in text-books," is not borne out by the facts. Tidy states that he has used the microscopic method throughout. Its fallacies have for years been abundantly emphasised in previous communications by the present writers and others. Now that the triple inoculation with mixed vaccine (typhoid, paratyphoid A, and paratyphoid B) has replaced the simple typhoid inoculation, it will be imperative to use methods that give accurate quantitative results. Otherwise the value of agglutination tests in the diagnosis of typhoid and paratyphoid fevers will become negligible. On the other hand, the method of using standard agglutinable cultures has been shown to give accurate and entirely comparable results in agglutination tests whether employed in purely scientific investigations or in the practical diagnosis of disease.

[6] Similar statements hold with regard to paratyphoid agglutinins.

## A NEW APPARATUS FOR THE ISOLATION AND CULTIVATION OF ANAEROBIC MICRO-ORGANISMS.

BY JAMES McINTOSH, M.D. ABERD.,
LATE GROCERS' RESEARCH SCHOLAR, ETC.;
AND
PAUL FILDES, M.B., B.C. CANTAB.,
ASSISTANT BACTERIOLOGIST TO THE LONDON HOSPITAL.
(*From the Bacteriological Laboratory of the London Hospital*—Professor WILLIAM BULLOCH, F.R.S.)

As is well known, the methods at present in use for the isolation and cultivation of anaerobic bacteria are in many ways unsatisfactory, and pure cultures of these organisms are so difficult to obtain that they are rarely attempted in ordinary bacteriological work. Indeed, the output of work upon this class of bacteria is relatively so small that some doubt is justifiable as to the correctness of some of the deductions even of the classical investigators.

It would appear that the difference between a successful and an unsuccessful growth depends upon the removal of the last traces of oxygen from the environment of the bacterium. Many methods have been devised to achieve this end, but their very multiplicity indicates a lack of means. Bacteria may be protected from the effects of oxygen by any of the following methods:—

1. By covering the surface of a liquid or solid medium with a substance impermeable to air, such as a layer of paraffin or a sheet of mica. The objection here is that oils and paraffin are not entirely impervious, and, further, any oxygen remaining in the medium is not removed.

2. The dissolved oxygen may be driven off by heat if the medium is not coagulable, or a reducing substance, such as glucose or sodium sulphide, may be added to the medium itself. The deep glucose-agar stab is a combination of methods 1 and 2. Under the same category comes the method of Theobald Smith and Tarozzi of adding a fragment of living tissue to the medium, which also has the effect of removing the oxygen. The objection to such methods is that surface growths are impracticable, and the medium requires to be more or less freshly prepared to give the best results.

3. One of the methods most practised is the cultivation in an atmosphere from which the oxygen has been removed by chemical means. An alkaline solution of pyrogallic acid is commonly used for this purpose, as in the well-known apparatus of Buchner and Bulloch. However, the affinity of such substances for oxygen is not sufficiently great to remove the gas totally from an atmosphere.

4. Many methods have been devised for the removal of oxygen by mechanical means, as by displacement with another gas or by the vacuum pump, or by a combination of the two, without, however, achieving decisive results.

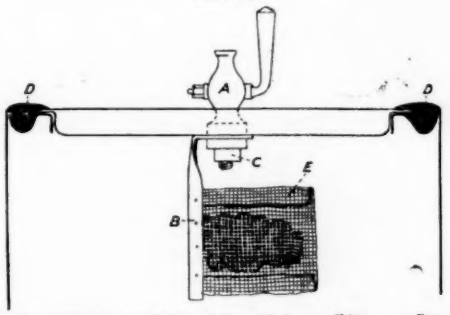
We had tried many of these methods without success, when we noticed that Laidlaw had suggested the use of platinised charcoal and colloidal platinum to remove the oxygen from anaerobic cultures, although Pfuhl had previously made use of the catalytic properties of spongy platinum to obtain anaerobic cultures in broth tubes exposed to the air. Our results with this technique were so promising that we determined to work out the method in greater detail, and have succeeded in producing an apparatus by which isolated colonies of anaerobes may be obtained upon the surface of ordinary laboratory media with great facility.

Our method consists briefly in enclosing the culture medium in an airtight vessel which has suspended in it a piece of asbestos wool impregnated with palladium black.[1] The vessel is then attached to a hydrogen generator and hydrogen is allowed to pass in, when it will be occluded by the palladium and combined with any oxygen present. A negative pressure thus develops inside the vessel and hydrogen will pass in until no oxygen remains. The apparatus is then detached from the generator, but the action will still continue and any traces of oxygen which diffuse from the medium itself will be rapidly removed. Thus a more or less complete vacuum towards oxygen is obtained.

*The making of the anaerobic apparatus.*[2]—A tin with a lever-off lid such as is used for paint is selected. It should measure 7 inches high by 5 inches broad. A small hole is drilled in the centre of the lid, and into this is fitted a small stopcock (A), such as is used for model steam-engines, the joint being made gas-tight with a little solder. Over the thread of the tap on the under side of the lid a small brass bracket (B), as shown in the diagram (Fig. 1), is fitted and secured by screwing up the collar (C) of the tap. The gutter round the top of the tin is next filled with plasticine (D); the pot, after having been tested for tightness, is then ready for use. The gas-tightness of the tin can be readily tested by pouring a few drops of ether inside. The lid is forced tightly into position and a little plasticine turned over the edge of the lid. The tap being shut, the whole tin is placed under hot water and any escape of ether vapour is immediately detected.

The palladium capsule (E) consists of a wire gauze envelope containing 0·25 grm. of asbestos-wool impregnated with palladium black. The palladium asbestos (about 40 per cent.) is made by weighing out 0·25 grm. of asbestos-wool, placing it in a small evaporating dish, and adding 1·5 c.c. of a 10 per cent. solution of palladium chloride. The wool is then moulded into a flat mass about 1 inch square and the dish gently heated until the wool is dry. The palladium chloride is somewhat difficult to dissolve, but the addition of a little concentrated hydrochloric acid will overcome the difficulty. The palladium chloride is then reduced by heating the impregnated wool first in a smoky gas-flame until it is coated with a layer of carbon, and then in the blowpipe. The palladium asbestos should now be able to

FIG. 1.



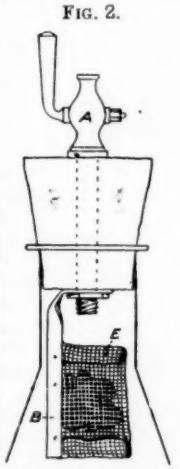

Anaerobic apparatus consisting of tin with lever-off lid. A = Stopcock; B = brass bracket secured by C = collar of the tap; D = plasticine filling in gutter; E = palladium capsule.

light a jet of hydrogen which is made to impinge on it. A piece of fine brass wire gauze of suitable size is then folded over the asbestos and the edges doubled over so as to form a complete capsule. The capsule is then clipped by one edge into the brass bracket in a vertical position under the orifice of the tap. Before use the inside of the tin and the under side of the lid should be varnished to prevent rusting, and when dry the bottom of the tin is protected with cotton-wool.

*Method of use.*—1. Place culture tubes inside the pot. 2. With a rag dipped into spirit spread the plasticine towards the periphery of the top of the tin. 3. Heat the capsule in the Bunsen flame. 4. Immediately force on the lid and push on to the open tap the rubber tubing from the hydrogen generator. The gas need not be purified in any way and commercial chemicals may be used in its preparation. 5. Turn on the gas. 6. After a minute or two close the tap, detach the rubber tubing, and with the moistened rag spread the plasticine from the periphery of the top inwards over the edge of the lid. 7. Again pass in the hydrogen until the increasing pressure stops the generation or the tin is absolutely cold. This takes about 15–20 minutes. 8. When the pot is to be used for gelatine media the temperature inside must be reduced by enclosing a quantity of freezing mixture (salt and ice).

*Application of the method to flasks and large tubes.*—We have used the same principle in the growth of anaerobes in flasks of broth or in test-tubes too large to get into the pot. In these cases a soft rubber stopper takes the place of the lid of the tin, as shown in Fig. 2, or the capsule may be attached by pins, heated and thrust into the stopper. When using this method it is essential to varnish the whole of the stopper and joints with thin gold size to ensure a gas-tight fitting. The gold size is easily scraped off later with a knife.

FIG. 2.




Anaerobic apparatus consisting of flask with soft rubber stopper. Lettering as in Fig. 1.

*Application of the method to plate cultures.*—Petri dishes may be enclosed in the pot in place of tubes, but it is desirable to use a small dish which can be accommodated in the standard pot. A larger pot requires a very careful adjustment of the quantity of palladium to the volume of the tin.

With earlier models of the apparatus we incorporated an indicator which showed the degree of anaerobism obtained within. The vessel was then made of glass, and a sterile tube of broth containing methylene blue was placed inside and the degree of bleaching observed. With the present apparatus this indicator is not visible from without, and we rely more upon the presence of a positive pressure, as measured with the hydrogen generator, as an indication of satisfactory conditions within. The only way in which the apparatus can fail is through a slight leak in the tap, and every method to avoid this should be adopted. The tap should be kept well greased and covered with an indiarubber

[1] Platinum may be used instead, but as the reaction is less intense a longer time is required to produce anaerobic conditions.

[2] Messrs. Baird and Tatlock, of 14, Cross-street, London, E.C., are prepared to supply the above anaerobic apparatus.

cap. If a tin is put away with an unsatisfactory tap, especially in the incubator, the cultures may readily be killed or may become grossly contaminated with moulds. When the anaerobic state is maintained satisfactorily moulds never grow inside the vessel.

*Practical results obtained with the apparatus.*—We have now had our apparatus in use for a number of months and we are able to obtain constantly satisfactory results. Our work has been directed almost entirely to the study of septic gunshot wounds, and we have isolated from these a large number of strains of bacteria, some of which we can identify while others are unknown to us. If one takes an ordinary sloped agar tube or, better, serum-agar and inoculates it with pus taken direct from a wound without any preliminary heating or other preparation either of the medium or pus, it is easy in 24 to 48 hours to grow isolated surface colonies of such bacteria as B. welchii or "malignant œdema," and then by subculture to isolate these strains pure. This isolation is easy, but at the same time it must be admitted that it is not so simple as is the case with most anaerobic organisms. It is not uncommon to find a contamination of a strain persisting through several subcultures from absolutely distinct colonies, and particularly is this the case with staphylococcus. Such cultures may, of course, be readily purified by heat, but we have avoided this method as far as possible owing to the impossibility of gauging at present the effect of heat upon the anaerobe. We have had little difficulty from contaminations with streptococci or colon bacilli; indeed, the conditions of the culture appear to reduce seriously the power of these bacteria to grow. We have been often struck by the inability of so-called facultative anaerobes to develop in our apparatus.

Having thus isolated a strain in pure culture it is very easy to study its behaviour upon the ordinary laboratory media, slope agar, agar stabs, broth, serum, gelatine, milk, and so on. Further, the action of the bacteria upon the various fermentable sugars or upon dye-stuffs may be determined and so valuable information obtained which may bear upon a more satisfactory classification of such strains.

It is well known that many anaerobes are affected in their morphology and biological characters—for instance, in the production of toxin—by the presence of sugar in the medium, and it is one of the advantages of the present method that dextrose is quite unnecessary for the furtherance of growth. We have thus been able to study these bacteria in a more stable condition than is usual.

*Advantages of the method.*—1. The method is clean. 2. It is rapid, the whole process being complete in about a quarter of an hour. 3. It is available immediately without any preliminary preparation or reagent other than hydrogen. 4. It is suitable for use with any laboratory medium without preliminary preparation of the medium. 5. It will grow the strictest anaerobes with great rapidity upon the surface of a solid medium. For instance, colonies of B. tetani in subculture upon serum-agar are visible in 24 hours.

We desire to express our thanks to Professor Bulloch for his kindly interest and advice on many points, and to Captain W. E. Bullock, R.A.M.C., for assistance and advice in the details of the method.

*Literature.*—1. H. Buchner: Eine neue Methode zur Kultur anaerober Mikroorganismen, Centralbl. f. Bakter. u. Paras., Orig., 1888, Bd. iv., p. 149. 2. W. Bulloch: A Simple Apparatus for Obtaining Plate Cultures or Surface Growths of Obligate Anaerobes, Ibid.,

(*Continued at foot of next column.*)

# GUNSHOT WOUNDS OF THE SPINE; THEIR SURGICAL ASPECT.[1]

BY DONALD ARMOUR, M.B.TOR., F.R.C.S.ENG.,

HONORARY LIEUTENANT-COLONEL, R.A.M.C.; SURGEON-IN-CHIEF, THE QUEEN'S CANADIAN MILITARY HOSPITAL; SURGEON TO THE KING GEORGE HOSPITAL, TO THE NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, ETC.

THOUGH injury to the spinal cord is not a necessary consequence of gunshot wounds of the spine, it is obvious that the chief interest of such wounds lies in the commonly associated injury to the spinal cord and nerve roots. From a clinical point of view, therefore, cases of gunshot wound of the spine may be divided into two main classes:—(1) Those in which the functions of the spinal cord are not interfered with; and (2) those in which there is more or less interference with the functions of the spinal cord, with or without obvious injury to the vertebral column. In the second group the damage to the spinal cord is usually immediate—i.e., occurs at the time of receipt of the primary wound. But it is of the very greatest importance to remember that in cases where the spinal cord has escaped immediate damage, later or remote effects involving this structure may follow on the injury to the vertebral column. These later effects are produced by inflammatory products giving rise to thickening of the meninges; adhesions between the dura and bony wall, the dura, pia-arachnoid, and cord, with subsequent pressure due to the formation of a simple serous cyst of the meninges; by narrowing of the spinal canal through excess or misplaced callus; by blood clot, intra- or extra-dural; or as the result of continued suppuration.

If the injury to the cord be immediate it may be caused by:—1. The missile itself passing through the spinal canal, in which case the cord is wholly or partially divided. 2. Fractured portions of bone driven in against the cord, causing compression, contusion, laceration, or complete division. This would appear to be the most frequent cause of the cord injury. 3. Concussion. Under this head are included those cases in which, though neither of the preceding causes is operative, yet as a result of the vertebral column being struck certain structural changes are set up in the cord which are due to the jarring or commotion effects of the blow. Spiller has described this condition as "traumatic myelitis." The cord may show no external signs of injury either to inspection or palpation. Lieutenant-Colonel Gordon Holmes has recently described in his Goulstonian lectures the microscopical appearances found in such cases. He points out that the special character of these lesions is their diffuse and irregular distribution and their tendency to diminish gradually from the point of maximal disturbance. He concludes: "Whatever may be the exact mechanism of spinal concussion it must be admitted that a sudden

[1] Being the opening remarks at a discussion at the Medical Society of London on March 20th.

(*Continued from preceding column.*)

Orig., 1900, Bd. xxvii., p. 139. 3. P. P. Laidlaw: Some Simple Anaerobic Methods, Brit. Med. Jour., 1915, vol. i., p. 497. 4. E. Pfuhl: Die Züchtung anaerober Bakterien in Leberbouillon, sowie in Zuckerbouillon und in gewöhnlicher Bouillon, mit einem Zusatz von Platinschwamm oder Hepin unter Luftzutritt, Centralbl. f. Bakter. u. Paras., Orig., 1907, Bd. xliv., p. 379. 5. Th. Smith: Some Devices for the Cultivation of Anaerobic Bacteria in Fluid Media without the Use of Inert Gases, Journ. of Boston Soc. of Med. Sciences, 1899, vol. iii., p. 340. 6. G. Tarozzi: Ueber ein leicht in aerober Weise ausführbares Kulturmittel von einigen bis jetzt für strenge Anaerobien gehaltenen Keimen, Centralbl. f. Bakter. u. Paras., Orig., 1906, Bd. xxxviii., p. 619.

violent impact on the vertebral column can produce diffuse, irregular, and severe structural changes within the spinal cord. The factors which determine the severity of these lesions must be the momentum of the projectile, the part and surface area of the vertebra which it strikes, and the region of the spine which is wounded."

Now, is it possible to recognise clinically these three different results of gunshot wounds of the spine? For were it so, the question of operative interference would be made very simple, inasmuch as the first and third groups obviously would be excluded as beyond surgical relief. Naturally, we turn to X rays as likely to be the most helpful agent in determining the nature of the injury. But, unfortunately, it is in gunshot wounds of the spine that, in my experience, X rays are most unreliable. This is not to be construed in any way into a criticism of the skill of radiographers. It is simply a statement of the limitations of the X rays themselves.

In the first place they may not reveal any bony injury even when present. This is particularly true of the single flat plate. In all such cases it is necessary to have stereoscopic plates taken. I have had two or three such experiences. Again, the X ray plate never reveals the full extent of the bony injury within the spinal canal—i.e., where the damage to the cord is being produced. This is not to be wondered at when we consider how small a piece of bone may be the traumatic agent and how much it is overlain and overshadowed by the vertebra surrounding it. Therefore, in my opinion, the X ray plate should only be regarded as confirmatory evidence, or used to assist in the localisation of foreign bodies or for the purposes of bony localisation.

In considering operative intervention, the questions that will arise are in order of importance:—1. Will any benefit to the patient result from the operation? 2. Will his life be endangered by the operation? 3. Will he be made worse by the operation?

The condition should certainly not be made worse by the operation, provided it is undertaken by a competent surgeon accustomed to operate frequently upon the spinal cord. Unless the operator has had considerable experience in spinal surgery, it is very easy to overlook the site and cause of the compression. In these cases there are two levels to be considered, the neurological and the bony. The level of the lesion as indicated by the clinical symptoms usually does not correspond with the level of maximal damage. This is explained by the secondary changes which take place above and below the site of the injury in the cord. It is essential, in order that an operation should be perfectly successful, that all pressure on the cord from whatever cause be removed. Hence the necessity for a wide exploration both vertically and laterally. It is not only not necessary, but it is bad surgery to waste time in searching for a missile which has ceased to do damage and has passage beyond the immediate area of operation. Yet one sees too frequently a sort of surgical hypnosis produced by an X ray plate which shows a bullet or piece of shell still in the human body, though perfectly innocuous at the time. This hypnotic state is apparently only recovered from when the operator is able to produce to the admiring onlookers the piece of lead, while his own satisfaction reminds one of a certain nursery rhyme connected with one Jack Horner. The operation is ended quite oblivious of the fact that the pressure on the cord has in no way been relieved by this "plumbic" manœuvre.

In septic cases care should be taken not to open the dura if still intact. If already opened care should be taken not to break down any adhesions of a protective nature lest a septic meningitis be set up. Drainage along the usual surgical lines must be employed in septic cases. In those cases free from sepsis the dura should be opened for inspection of the cord.

The patient's life will not be endangered by the operation if a proper estimate has been made of his general condition beforehand. The chief and most frequent contra-indication is a general septic condition arising from the state of the kidneys and bladder, with persistent high temperature and perhaps rigors and a weak and irregular pulse. There is an added danger where the intercostals are paralysed, but with a skilled anæsthetist this may be obviated.

Will any benefit result from the operation? Let us consider what the operation may be expected to do. Briefly, it will relieve pressure, or, at any rate, remove any doubt as to whether continued pressure exists. If the spinal cord be not totally destroyed continued pressure may succeed in completing its destruction. Therefore operation is indicated: (1) To relieve pressure from depressed or displaced fragments of bone; (2) to relieve pressure from blood-clot or from extensive hæmorrhage, either extra- or intra-dural; (3) to relieve pressure and prevent further destruction from œdema by enlarging the constricted bony canal; (4) to remove the future danger of pressure from exudate and inflammatory thickening.

No operation will restore a cord in which complete transverse section has taken place. Nor will an operation benefit cases of concussion. Therefore we are brought back to the question upon the answer to which hangs the whole subject of operation: Are there any symptoms by which we can in a reasonable time determine beyond a doubt that we are dealing with a case either of complete transverse section or of pure concussion? In short, is there any symptom-complex which establishes beyond a doubt that the injury to the cord is irremediable? If there is not, then should not such a conclusion urge us to give our patient the benefit of an operation which experience shows neither materially endangers his life nor adds to his discomfort, but actually lessens his pain? It will at least allow us to determine the exact nature and extent of the lesion and to place the cord under the most favourable conditions for recovery of function, if recovery be possible. I have said a reasonable time. It is unfair to the patient and unfair to surgery to wait on and on till hope gives place to despair and then to call in a surgeon as a last resource to perform the impossible.

Harley-street, W.

LITERARY INTELLIGENCE.—The *American Journal of Gastroenterology* has combined with the *Proctologist* and hereafter will be published as the *Proctologist and Gastroenterologist*, from St. Louis. Dr. Rollin H. Barnes, St. Louis, will be managing editor and publisher.

THE FINSBURY DISPENSARY.—Owing to the war the customary biennial festival of this institution has been abandoned, and the Lord Mayor of London, as vice-president, makes an earnest appeal for funds to carry on the work. Contributions may be sent to him at the Mansion House, or to the secretary, Finsbury Dispensary, Brewer-street, Goswell-road, E.C.

# ANÆSTHESIA FOR ENUCLEATION OF TONSILS.

BY J. BLOMFIELD, M.D. CAMB.,
SENIOR ANÆSTHETIST, ST. GEORGE'S HOSPITAL, ETC.

IT might well be imagined that there is nothing worth saying that has not already been said upon the question of anæsthetics for operations upon the tonsils. The operation now in vogue, however, for their complete removal makes a call upon the anæsthetist very different in degree from that hitherto demanded by the less radical procedure. Nor does it appear from recent correspondence in the *British Medical Journal* that this difference is on all hands fully recognised. Before the enucleation operation was introduced, an anæsthetic for the ordinary operation of tonsillectomy was a short and not formidable undertaking and one that was widely in the hands of the comparatively inexperienced. The present position is very different, and all anæsthetists will, I think, agree that to manage the anæsthetic with perfect success during the enucleation of both tonsils by dissection, with or without the use of guillotine or snare in addition, makes a tax upon experience and skill scarcely rivalled by any other operation of the same comparatively short duration. The reason for this is chiefly that most operators find their work hampered when freeing the tonsil if there is any contraction at all of the faucial muscles. To achieve this means procuring a degree of narcosis which might well be considered excessive in any other relation; it is actually a degree which places the child at the very limit of safety if, as is generally the case, chloroform is employed. There is a wide difference between the narcosis during which a tonsil can be rapidly cut across, as in the old days, without any reflex movement being evoked, and that which must be maintained whilst the organ is dragged or manipulated or dissected out of its very bed. It is true that some operators do not mind, or even prefer, an anæsthesia which permits the child to cough if blood remains on the back of the pharynx, an anæsthesia in which there is contraction of fauces to some extent during the manipulations which effect the dislocation of the tonsil from its bed. These surgeons, however, are in my experience in the minority, and most prefer that deep narcosis in which the fauces are absolutely slack in spite of severe pushing or dragging. It is this form of anæsthesia, therefore, that the anæsthetist is commonly expected to procure.

There are, of course, several means by which this can be done, all of them providing a perfectly satisfactory condition so far as the operator is concerned. They are not, however, all equally safe, nor do they all provide a sufficient anæsthesia for the same length of time. For example, in the days of the partial removal of tonsils by rapid operation "gas and oxygen" was often an admirable anæsthetic in adults. In suitable subjects it can be employed to-day for the complete removal, but only if this is to be effected without any dissection. Even if the dragging forward of the tonsil is necessary to ensure its complete encirclement by the guillotine or snare, then "gas and oxygen" rarely provides for a comfortable operation if both tonsils have to be removed. The case of ethyl chloride is similar, although it must be said for this anæsthetic that it is of the utmost service in children. Thus, in out-patient practice at St. George's Hospital we have for years employed it in young children who have both adenoids and tonsils removed, and we find it sufficient for complete removal when this is done by the guillotine, even when a small amount of dissection is required too. Naturally much depends on the expertness of the operator; and, moreover, there is not time with ethyl chloride for that attention to bleeding and thorough inspection of the areas operated upon which many operators prefer. That complete enucleation of both tonsils with the guillotine can be performed under these conditions, however, I have seen demonstrated in scores of cases where Mr. H. Barwell has shown the glands with their capsules after removal, and has allowed students to palpate the smooth evacuated beds of the glands in the fauces. It is not the ideal arrangement to handicap the operator in the least degree by the shortness of the anæsthesia, or to let the child cry or vomit or realise its surroundings before it is back in bed. Consequently ethyl chloride in these cases should, I think, only be regarded as a best possible under the circumstances of out-patient operation, and seldom as the anæsthetic of choice for in-patients or in private practice.

We come, then, to the question of a deep degree of narcosis obtained by the use of ether or of chloroform, or of both. From the point of view of bleeding and of mucous secretion, ether from any closed apparatus should, I think, be avoided in these cases. It used to be a favourite plan to induce anæsthesia by "gas and ether," keeping up the ether for five minutes or so till the patient was well charged with the drug, and then to give chloroform on an open mask for a minute or two, allowing the congestion previously induced to pass away. No doubt a quite sufficient narcosis is obtained in this way, and can be maintained efficiently by continuing chloroform through the tube of a Junker's inhaler whilst the operation is in progress. Yet I believe the condition is never so satisfactory as that obtained if the anæsthesia is induced without any, or only an extremely short, employment of closed apparatus.

Generally speaking, the best method, both for children and adults, consists, I believe, in giving a preliminary dose of atropine, gradually inducing a very deep degree of narcosis by a mixture of chloroform and ether, supplemented in some cases by a few minutes of open ether, and in some adults by a very few minutes of ether from a Clover's inhaler. There should be no congestion whatever by the time the operation begins, and the atropine prevents any undue mucous secretion. The anæsthesia thus obtained generally suffices for the entire operation. When it does not, chloroform is used from a Junker's inhaler or the open mask is reapplied. The same extreme degree of narcosis necessary during dissection need not be kept up whilst the bleeding is being stopped, in the case of operators who prefer to see deliberately to the stopping of all hæmorrhage after each tonsil is removed. The fear of a varying depth of narcosis is, I believe, largely a fetish. So long as there is no return to consciousness it is far better that the absolute absence of reflexes kept up during removal of the tonsil should lapse, whilst the hæmorrhage is receiving attention, to a condition in which the coughing reflex and the faucial reflex are present. To allow this is, moreover, to minimise the possibility of secondary or recurrent hæmorrhage, which is a mischance not to be ignored, at any rate after enucleation in adults of fibrous and adherent tonsils.

The importance of the position of the patient during operation varies completely according to the way in which the bleeding is treated. If, as with some operators, there is constant sponging, the position of the head is a matter of indifference, for no blood is allowed to descend. If, on the other hand, there is no attempt to stop the bleeding or to interfere with it in any way until the operation is completed, then obviously steps must be taken to avoid the possibility of inhalation of blood during removal of the second tonsil. It is better to achieve this by the safety of the position adopted than to have to rely upon a light degree of narcosis permitting coughing—better, at any rate, from the surgeon's point of view. Position, in fact, must be settled entirely in accordance with the operator's convenience, the anæsthetist realising, however, that in some positions, unless there is constant sponging, he cannot with safety provide a deep narcosis. Sitting, or lying with the head on one side, or with the head straight, are equally satisfactory in the case of operators accustomed to the respective positions, but the anæsthetist has certainly to vary his practice to suit the circumstances and to keep a keen eye upon the exact extent of narcosis maintained.

Harley-street, W.

# PAIN IN RENAL AND VESICAL LESIONS:

## ITS CHARACTERISTICS, ITS ANOMALIES, AND ITS MISGUIDING MANIFESTATIONS, WITH 12 ILLUSTRATIVE CASES.

BY DAVID NEWMAN, M.D. GLASG.,
CONSULTING SURGEON, GLASGOW ROYAL INFIRMARY.

(*Concluded from p. 729.*)

(*j*) IN *malignant tumours* of the kidney hæmaturia is the most prominent symptom, and is present frequently for a long period before pain is complained of. Hæmaturia is the symptom which most frequently induces the surgeon to make an examination of the loin, but, for the reason that it is unassociated with pain, it is often allowed to go on without a sufficient regard to consequences. The belief that malignant disease is necessarily associated with pain has, unfortunately, got a firm hold of the professional mind as well as that of the public. The absence of pain is therefore regarded as a good omen; but the absence of pain, from a diagnostic point of view, is a great misfortune. The most easily appreciated danger-signal is wanting. In the early stage pain is often absent, and sometimes especially in sarcomata, the whole course of the disease is practically painless. Suspicion is not aroused, and rapid progress takes place before the nature of the malady is even suspected.

CASE 9. *Unilateral painless renal hæmaturia during nine months, continuous at first, afterwards intermittent; blood from left ureter only, no shadow; round-celled sarcoma of left kidney; nephrectomy.*—The interest of this case is the entire absence of pain and the absence of swelling in either renal region. The diagnosis was made by a cystoscopic examination only. Nine months prior to examination the patient had a moderate symptomless hæmaturia, and he was able to resume work in a month or so. In four weeks thereafter he had a second hæmaturia when the bleeding became intermittent, being sometimes absent for a day at a time. Blood clots were passed. Otherwise there were no symptoms. The kidneys could just be felt and pressure did not produce pain. No shadow. Urine normal unless during the attacks of hæmaturia; bladder normal, but blood was seen escaping from left ureter only; healthy urine from right kidney. On exploring the kidney the upper pole was found to be occupied by a spindle-celled sarcoma about the size of a duck's egg. The tumour was firmly adherent to the diaphragm, so that the removal of the kidney was difficult.

In malignant disease the pain, when present, is most severe in the situation of the affected kidney, but, specially in the later stages of the disease, it may extend to distant parts. In character it is dull and aching, but may be paroxysmally increased, though not by movements of the body as in renal calculus. The suffering of the patient is generally more severe in scirrhous cancer than in acute carcinoma or sarcoma. It is frequently the cause of difficulty in micturating, even although the bladder is free from the disease. The pain presents great differences in its character; it may be at first slight, vague, and not constantly present, at other times it is entirely absent, or it may be severe and prolonged. In not a few instances the sense of discomfort in the lumbar region is the first indication of disease. Gradually, as the tumour increases in bulk, the suffering of the patient becomes more intense and more constantly present. At first dull in character, later it becomes lancinating, and may either arise spontaneously or be provoked by pressure, but it is seldom aggravated by movements of the body. When the tumour has attained considerable dimensions, or has invaded the tissues around so as to involve or compress the nerve trunks, the pain, instead of being limited to the lumbar region or hypogastrium of the affected side, may extend to the chest, across the middle line, or to the hip and lower extremities, which may lead to the disease being mistaken during this stage for sciatica or rheumatism.

The points to attend to in diagnosis are: 1. A swelling bulging forwards posterior to and covered anteriorly by the colon, resonant in front, dull behind, which retains a renal form and extends under the ribs. 2. Hæmaturia from one ureter, at first slight and at moderately long intervals, afterwards more frequent and severe, ultimately continuous and alarming. 3. Pain sometimes absent, and when present is constant and is principally due to pressure on nerves; the lumbar plexus causing pain like sciatica or intercostal pain like pleurisy. 4. Pulse and temperature normal. 5. No shadow, and no tubercle bacilli present.

(*k*) *Infarction* of the kidneys may be simple when a non-infected embolus is carried to the kidney and causes a thrombosis. Then pain may be induced by a secondary hyperæmia, but it is seldom severe or lasting. But if the embolus is infected a circumscribed suppurative nephritis is established, when the pain is sudden in its onset and stabbing in character and limited to the umbilical area in the early stage, but soon extends to the whole lumbar region. The abdominal walls become rigid and tender, and the kidney is difficult to palpate until pus forms, when a fluctuant swelling can be discovered. The case then presents the characteristics of a perinephric abscess already described.

(*l*) *Nephralgia* is probably a misleading term, and is as unsuitable as "essential neuralgia" as applied to the kidney. These sudden attacks of severe pain in the kidney are due either to an abrupt obstruction to the escape of urine from the ureter or to a temporary passive hyperæmia from torsion of the renal veins as already described under movable kidney or backward blood pressure in cardiac disease.

(*m*) *Aneurysm of the renal artery* seldom causes much pain, and when confined to the renal pelvis the only symptom may be hæmaturia. The pain

when present may be accompanied with pulsation and the condition is liable to be mistaken for rupture of the kidney with hæmaturia. Aneurysm of the renal artery not of traumatic origin is very rare.

(*n*) *Rupture of the kidney* is a common accident, and the symptoms depend upon the extent of the injury. When the spine is acutely bent upon itself, the kidneys, being firmly bound to the column, are made to describe a contortion similar to that of the spine, as a consequence of which not only may the convex aspect of the organ be lacerated and torn transversely, but the sudden jerk may force the kidney away from the middle line and tear the pelvis or the ureter. The blood may therefore escape in two ways—into the tissues surrounding the kidney, where, if the patient survives, it may give rise to perinephric inflammation and abscess, or by passing down the ureter it may give evidence of the injury the kidneys have sustained. But while laceration of the kidney may occur without a bruise in the loin, in the majority of instances a blow upon the lumbar region is the direct cause.

There is not much difficulty in diagnosing this form of hæmaturia. The history of a lumbar sprain or of a blow or crush on the loin, indicated perhaps by ecchymosis, leads one to suspect rupture or contusion of the kidney. Severe damage to the kidney may, however, exist independently of any injury to the other abdominal organs, and may of itself prove rapidly fatal; but in the majority of cases there is evidence of violence elsewhere, and there are symptoms of rupture of other internal organs, especially of the spleen and liver. Generally there will be marked and rapid collapse, pain in the course of the ureters as well as in the lumbar region, retraction of the testicle, difficulty in micturition, or even anuria.

When the rupture is on the surface of the kidney only the pain may be sharp and severe, but on account of injury to other parts it is difficult to estimate how far the renal lesion is to blame for the suffering. Renal colic may be induced by clots forming in the pelvis or ureter.

Frequently the production of pain is by no means easily explained, and may be due to reflex influences producing disorders in other organs. A good example of this is the pain observed in cases of movable kidney. On one occasion the pain may be of strictly renal origin and due to a transitory hydronephrosis; at another time there may be no dilatation of the pelvis of the kidney, but the patient may suffer from intestinal colic and great flatulent distension. The acute pain which is so commonly met with in diseases of the kidney so closely resembles the paroxysmal pain produced by spasmodic contraction of the intestine that the term colic has been applied to it, although quite unconnected with any disease of the alimentary tract. Frequently cases are encountered in which the kidney is the seat of stone, but the pain is not referred to the renal region, and being accompanied by nausea, loss of appetite, and vomiting, is very liable to be mistaken for intestinal or other forms of colic.

It would be well now to consider the points of distinction between paroxysmal pain in the abdomen due to conditions most likely to give rise to suffering simulating renal pain: (*a*) Spasm of the bladder; (*b*) uterine colic; (*c*) abdominal tumours; (*d*) in gall-stone; (*e*) in appendicitis; (*f*) intestinal derangement; and (*g*) in lesion of the lumbar and dorsal nerves.

(*a*) In *spasm of the bladder* it must be remembered that pain may be experienced in the urinary tract over an area distant from the actual site of the disease. We find that occasionally in impacted calculus of the kidney the pain is referred to the bladder; conversely, in diseases of the bladder the suffering may be most intense in the lumbar region. Spasm of the bladder is generally caused by the presence of some irritant, either in the viscus itself or in some other part of the urinary tract. Ulceration or inflammation of the kidney may produce such an intense spasm in the bladder that it leads the patient to concentrate his attention on the latter organ. Generally, however, spasm of the bladder is the result of the presence of a stone blocking the exit and preventing the escape of urine from the viscus; to ulceration, especially of a tuberculous nature; or it may be induced by morbid lesions in adjacent organs, such as the uterus or rectum. The pain is interrupted, there is a marked sense of constriction in the lower part of the pelvis, and the irritation may extend to the thighs, to the spine, or upwards towards the kidneys. The bladder may become considerably distended, and as it fills the agony increases, the patient becomes pale, the skin cold and clammy and covered by perspiration; and to distinguish it from the pain produced by renal disease the patient experiences much difficulty in passing urine.

(*b*) *Uterine colic* is mostly complained of at the menstrual period, but is not necessarily limited to it. Associated with sickness, nausea, and vomiting, it is very liable to be mistaken for renal colic; and if, in addition to these symptoms, there is numbness in the lower extremities, at the flexion of the thighs, and retention of urine, the diagnosis is difficult. In the great majority of cases, however, the pain of uterine colic is more severe in the pelvis, it is generally associated with tenderness over one or both ovaries, and there are evidences of deranged menstruation.

(*c*) *Aneurysm of the abdominal aorta and abdominal tumours* may or may not be accompanied by pain, but when they give rise to much suffering, especially if it is paroxysmal, the condition is liable to be mistaken for renal colic. On the other hand, renal pain may simulate aneurysm. In a large proportion of cases of movable kidney, and of renal calculus in emaciated persons, the aortic impulses are exaggerated, and at once attract attention; and, as the pain and pulsation are often associated together in the mind of the patient, the pain is referred to the area of pulsation, and so an incorrect description is given to the surgeon.

In movable kidney and in fixed displacement of the kidney the organ may lie in front of the aorta and be carried forward by each impulse. In aneurysm the pain is most severe in the back, but may extend down the sciatic nerve to the legs. As a rule it is constantly present and dull, with intermittent paroxysmal attacks of severe pain, which generally come on during the night or in the early morning. Beyond these characteristics there is nothing in the nature of the pain to distinguish it from renal colic; the condition must be recognised by the physical signs.

In *tumours of the abdomen* the character of the pain and its duration depend upon the situation and the nature of the neoplasm and the organ primarily involved. The attending symptoms vary greatly, but these and the physical signs are generally sufficient to guide the surgeon. The subject is, however, too large to discuss now.

(*d*) The pain of *gall-stones*, when impacted, very closely resembles that observed in renal calculus. It is, however, more marked in the epigastric region, is associated with jaundice, the voiding of gall-stones, and evidence of a deficiency of bile in the stools.

(*e*) In *appendicitis* the pain at the onset is not very severe, is accompanied by symptoms of acute disorder of the digestive organs, and is associated with swelling in the right iliac fossa, to which area the pain is at first limited; whereas in renal colic the pain is most severe in the lumbar region and downwards to the middle of Poupart's ligament.

(*f*) In the severe pain and colic of *perforation of the bowel*, of *hernia*, or of *intussusception*, the extreme and sudden prostration, the disposition of the patient to remain resting in a flaccid position with the knees flexed, the history of obstinate constipation, retraction of the abdominal walls at the onset, followed by steadily increasing abdominal distension, make the diagnosis easy. The physical signs and the nature of the pulse are generally characteristic.

(*g*) *Neuralgia of the dorsal and lumbar nerves* gives rise to pain in many respects resembling renal colic, and, indeed, a renal affection may be the immediate cause of the nerve irritation. When due to a perineuritis, spots painful to the touch may be found along the course of the nerves or their branches. These are generally a little to one side of the first or second lumbar vertebræ or about the middle of the crest of the ilium. The attacks of neuralgia are of frequent occurrence, and are unassociated with renal disturbance.

*Differential Diagnosis of Affections of the Bladder Causing Pain.*

(*a*) Cystitis; (*b*) tuberculosis; (*c*) tumours; (*d*) calculus; (*e*) distension—(1) enlarged prostate, (2) stricture, (3) tumour, and (4) calculus; (*f*) rupture; (*g*) pericystitis; and (*h*) cystalgia (coli bacillus lesion in women).

(*a*) *Cystitis* is generally associated with pain and frequency of micturition, but the amount of suffering depends upon whether the inflammation is mild, severe, or chronic, as well as the particular area of the bladder attacked.

In mild cases pain is not a marked symptom except during and immediately after micturition, when the pain is burning in character. In acute cases the onset is sudden, often with a rigor, the temperature is raised and may be distinctly febrile; the pulse is rapid, and the tongue is coated, the digestion disturbed, the stomach and intestine distended with gas, and the bowels constipated.

The patient is unable to sleep because of the pain and frequent call to micturate. As soon as the desire comes it must be gratified—the urgency is sudden and imperative. During the act the discomfort is great, but it is at its termination and for a variable time thereafter that the burning pain is most severe. The patient not only strains to get rid of the last drops of urine, but there is tenesmus.

This is the most important symptom. The bladder contracts powerfully, but the sphincter contracts as well, so that for a time nothing happens; the viscus cannot be emptied. Then the spasm at the neck of the bladder yields for a moment or two, and a few drops of urine are permitted to escape. Repeated evacuations of this kind occur and are associated with severe pain in the rectum, the perineum, and the point of the penis. After the viscus has emptied itself its muscular wall continues to contract and squeezes from its congested mucous membrane a few drops of pure blood.

Between the acts of micturition the patient suffers from a dull aching pain over the pubes, which is increased on pressure and by the gradual filling of the bladder, and as the organ becomes distended a sense of weight and tenderness develops in the perineal region.

Local pain shows itself in three situations: in the urethra, over the front of the bladder, and in the rectum and perineum. Pain in the suprapubic region is usually constant, dull, and aching, while in the urethra it is associated with micturition only—before and during the act, when the bladder is uniformly involved, and principally after the act, when the lesion is limited to the neck and the trigone. When the base of the bladder is seriously implicated, or if the inflammation is very acute, the pain may extend to the rectum and perineum.

Reflex pain may be referred to the kidneys, the umbilicus, the penis, the scrotum, and in rarer cases to the leg and foot. These reflexes have been already described. The symptoms associated with cystitis are: 1. The presence of pus in the urine with infective organisms; in acid urine, bacillus coli, tubercle bacillus, streptococcus pyogenes, and pneumococcus; in alkaline urine, staphylococcus pyogenes aureus and albus and mixed infections. 2. Hæmaturia, the blood corpuscles and colouring matter being well suspended in the urine and not readily forming a deposit. 3. Abundant mucous deposit. 4. Frequent micturition.

CASE 10. *Very painful and frequent micturition from staphylococcus infection of bladder; pyuria and hæmaturia; only 2 oz. of urine retained; acute catarrh of base; instillation of silver nitrate; suprapubic drain; lactic bacillus cultures and irrigation; cure in six weeks.*—The patient, aged 40 years, married, was admitted to the Glasgow Royal Infirmary on August 21st, 1912, complaining of very severe pain during and after the act of micturition, so severe as to bring on sickness and severe headache. She had an inclination to pass urine every half hour, but very little came away at each time, not more than 2 oz. The urine was muddy and bad-smelling, and was always tinged with blood. The urine when passed was alkaline, and contained pus in abundance and "strings" of blood. The only organism found was staphylococcus pyogenes albus.

August 27th, 1912: When under an anæsthetic the bladder was able to retain 4 oz. only, but after treatment to Sept. 6th 7 oz. were retained. An instillation of silver nitrate was used.

Oct. 19th: Cystoscopic examination. The floor of the bladder is inflamed, and there are a number of small prominences on the surface of the mucous membrane in the trigone. These are coated with phosphates, which are irregularly distributed, forming patches and edges. The pure white phosphatic deposit stands out in marked contrast to the deeply injected mucous membrane.

Oct. 29th: Suprapubic cystotomy was performed, and a mass of pulpy granulation tissue was removed from the neck of the bladder. Dec. 6th: Bladder washed out with boric acid solution and filtrate of saurine (lactic acid cultures) for five weeks, without much improvement in the local pain, but with great improvement in the condition of the urine. Yesterday patient had no pain and passed urine naturally. Frequency has greatly diminished. Dec. 10th: The wound is now closed. Symptoms have undergone sudden improvement. Frequency has been reduced to four or five times a day. Dec. 17th: Pain absent for a week. Dismissed. March 20th, 1914: Reported well.

(*b*) *Tuberculosis of the bladder* in the early stage is associated with frequent micturition, but seldom with severe pain. As cystic tuberculosis is almost always secondary to a renal lesion the early symptoms referred to the bladder are probably an example of reno-vesical reflex. It is when the base

of the bladder, especially the trigone and the neck, is attacked that pain becomes a pronounced symptom. When the infection becomes mixed, and the organisms cause decomposition of urea, the urine becomes alkaline; then the suffering of the patient is often excruciating during and immediately after micturition and is often accompanied by tenesmus. It is particularly severe at the end of the act and the area of greatest intensity is in the urethra and glans penis. As in other forms of cystitis the pain is referred to the renal region, over the sacrum, to the groin, and down the thighs.

The symptoms associated with tuberculosis of the bladder are: 1. Pyuria in acid urine with tubercle bacilli. 2. Evidence of tuberculosis in the kidney. 3. History of polyuria and small repeated hæmaturias. 4. Frequent micturition, at first without pain, afterwards with severe pain in the urethra and the point of the penis during and after micturition. 5. Remission of early symptoms for longer or shorter intervals. 6. Tuberculous lesion seen by cystoscope.

(*c*) *Tumours of the bladder* are not characterised by pain; in fact, the absence of pain is one reason why their presence is liable to be overlooked. The cardinal symptom is hæmaturia, often symptomless in the early stages. In hæmaturia the absence of pain is too likely to be looked upon as a good omen, but the absence of pain, from a diagnostic point of view, is a great misfortune. The most clamant feature of disease is wanting. The patient may be alarmed while the bleeding lasts, but when it stops and there is no pain he is willing to regard himself as cured by some drug he has taken; the bleeding recurs, and it is stopped by the same remedy, and again he is satisfied, whereas if pain had continued to be present, as in stone in the bladder, the patient would seek advice and procure relief from his suffering.

CASE 11.—*Hæmaturia during six months, at first small in amount, only occasional, and unaccompanied by other symptoms; later continuous, and accompanied by frequent micturition, finally by incontinence, and severe pain; malignant adenopapilloma occupying almost entire bladder, infiltrating deep structures and surrounding parts; suprapubic cystostomy for drainage; radical operation inadvisable.*—The patient, aged 52 years, was admitted to the Glasgow Royal Infirmary on Jan. 6th, 1913, complaining of hæmaturia of six months' duration. When it commenced it amounted to little more than a tinging of the urine with blood, and was only occasionally noticed. At first the bleeding was unaccompanied by pain, but gradually, as it increased, the patient experienced difficulty in micturition associated with a burning pain at the point of the penis. At first the pain and the bleeding were intermittent, but about a month prior to admission both became constant and increased in degree. Bright red blood clots were passed, and the pain was distinctly increased when the bladder was emptied. Together with these symptoms he had frequency in micturition, amounting to 12 or 14 demands in the 24 hours, and during the last month he lost control completely.

He never complained of pain in the back, but in the lumbar region, on the left side, there was considerably increased resistance, probably due to enlargement of the kidneys, and there was pain on deep pressure along the line of the left ureter.

Since ten days prior to admission the patient was confined to bed without any remission in the symptoms; indeed, with rest in bed the incontinence became worse. The bowels had been regular, but when they were moved considerable sharp pain had been experienced, and this for several days before he was admitted. Thoracic and abdominal organs were normal. The patient was very stout, the skin of a greyish colour and pale, but the mucous membranes and conjunctivæ were well coloured. Urine acid, specific gravity 1010, deeply blood-stained, contained much albumin and a deposit of red corpuscles, and a considerable amount of pus.

Jan. 7th: On account of bleeding I found considerable difficulty in getting a good view of the interior of the bladder, but after several washings a large tumour mass was seen nearly filling up the whole of the interior of the viscus. Jan. 9th: The patient suffered very severe pain and was losing a large quantity of blood, while the quantity of urine passed was very small. A suprapubic incision was made, and a large quantity of recent clot and old laminated thrombosis was removed. A fragment of the tumour was taken for microscopic examination. A drain was inserted and the bladder washed out. Jan. 20th: The bladder was carefully washed with boric acid solution three times daily. The bleeding was markedly reduced and the secretion of urine steadily increased, but the patient's general health was evidently failing rapidly. Under chloroform a careful and complete examination was made, when the tumour was found to be very large in size, almost filling the bladder, infiltrating the deep structures and surrounding parts. The kidneys were enlarged. Tumour an adenopapilloma. Feb. 3rd: Patient gradually lost strength and died this morning.

Pain may result from three causes—septic infection of the bladder, obstruction to the escape of urine, and infiltration of the bladder wall and the neighbouring structures by growth. The first mentioned is liable to occur after the use of instruments for the relief of retention, and when sepsis is established in such cases it is of an acute type and all the symptoms of severe cystitis are set up. The urethra may be blocked by blood clot or portions of the tumour, and pain may arise from over-distension, but the involvement of sensory nerve filaments in the new formation is the cause of greater suffering which is continuous and severe. It may be felt in the urethra, in the penis, over the bladder, in the groin, and down the leg. In the absence of cystitis, pain in the bladder, and radiating along the sciatic nerve and the anterior crural, not confined to the act of micturition, is a sign of malignant disease as distinguished from a benign tumour.

The symptoms associated with tumour of the bladder are: 1. Hæmaturia commencing gradually, a few drops at the end of micturition, without pain, afterwards with attacks of severe bleeding and passage of clots. 2. Frequent micturition without pyuria. 3. Portions of growth may be passed. 4. No crystalline deposit. 5. No X ray shadow. 6. Growth seen with cystoscope.

(*d*) *Calculus in the bladder* is indicated by pain, hæmaturia, and frequent micturition. The degree of suffering depends upon the nature and shape of the stone as well as the condition of the vesical mucous membrane. So long as the bladder is free from sepsis smooth uric acid calculi, even of large size, may occupy it for years without causing much inconvenience. But if infective organisms gain access, decomposition of urea leads to an alkaline reaction of the urine, phosphates are deposited on the surface of the stone, and in place of being smooth it becomes rough and irregular. This change in the character of the surface as well as the urinary sepsis contributes to the suffering of the patient. Therefore, if the stone is smooth and the mucous membrane normal, very little annoyance may be caused. This also happens when the calculus is fixed in a diverticulum if it is lodged behind an enlarged prostate.

Again, pain may be absent when along with a phosphatic stone there is bacillus coli infection of the bladder. The acid reaction of the urine causes the surface of the stone to be eaten into so that it presents a honeycombed appearance. This surface entangles the mucus which comes to envelop the calculus and so protects the mucous membrane

from irritation, while it also prevents the stone from being discovered by a sound. I published a case of this kind some years ago and said:—

CASE 12. On cystoscopic observation I found a white woolly mass occupying the floor of the bladder, the shape of a pigeon's egg, and about the same size. From its appearance and form one suspected the presence of a stone, but on passing a sound into the bladder no hard object could be found. Instructions were given to have the bladder washed out regularly twice a day for a week. At the end of that time another examination was made, and a clear phosphatic stone was found lying in the floor of the bladder covered with flaky mucus. In this case the stone had become completely enveloped in a mucous coating of considerable thickness, so that a sound could not possibly convey to the hand or to the ear the impressions we usually expect in a vesical calculus.

On the other hand, if the stone is composed of oxalate of lime, a rough, heavy, and jagged stone, severe and constant pain is experienced. The pain is increased by movement and relieved by rest, is aggravated during micturition, especially at the end of the act, when the mucous membrane is brought in firm contact with the stone, and may persist for some time thereafter.

The location of pain and the reflex pains are the same as in cystitis. The symptoms associated with calculus in the bladder are: 1. Hæmaturia at the end of micturition accompanied by pain. 2. Frequent and painful micturition. 3. Pyuria and crystalline deposit in urine. 4. X ray shows a shadow in the bladder area. 5. Stone seen with cystoscope.

(*e*) *Distension of the bladder.* When due to atony its wall is sclerosed and its muscular elements are degenerated, sensation is impaired, and little pain is complained of. Likewise, when the obstruction to the escape of urine is slowly developed, as in stricture or enlarged prostate, a dull aching pain in the region is all that the patient suffers. It is when the obstruction is sudden, as in impaction of a calculus or blocking with blood clot, that severe pain is experienced, and this increases in degree until relief is obtained. The most common causes are stricture, enlarged prostate, calculus, and tumours of the bladder.

(*f*) *Rupture of the bladder* causes severe pain in the lower part of the abdomen with a great desire to micturate, and may be the result of external violence, over-distension, or the misuse of instruments. Spasms of severe pain come on at intervals, the abdomen is rigid and tender on palpation, and when a catheter is passed only a little blood comes away. There is marked shock. The history of injury clears the diagnosis.

(*g*) *Pericystitis* may follow injuries to the bladder. When an abscess forms in the space of Retzius there may be intense pain and strangury and great suprapubic tenderness, high temperature, and rigors. Pain is not influenced by micturition, is increased by pressure in front, and the urine is clear unless the abscess ruptures into the bladder. The pain is distinctly local.

(*h*) *Cystalgia* I cannot recognise as a separate disease, although it has been frequently described as such. Cases are undoubtedly met with where women suffer severe burning pain extending sometimes to the perineum, increased when sitting, and travelling is rendered very difficult, causing agony. In these cases a lesion is always found with the cystoscope or the urethroscope.

In addition to the condition just described, a form of irritable bladder is common where the patient is distressed by frequent micturition during the day, and during the night there may be occasional incontinence. The only complaint may be pain and frequency, and although it may be most troublesome and inconvenient to the patient, from the nature of the illness she is liable to hide or minimise her suffering rather than seek medical advice.

The cystoscope shows in many cases congestion around the neck and some hyperæmia of the mucous membrane of the first portion of the urethra; the urine contains a large quantity of mucus and bacillus coli, but no pus. With suitable local treatment the symptoms disappear.

## ON THE CONNEXION BETWEEN "SOLDIER'S HEART" AND HYPERTHYROIDISM.

BY FLORENCE A. STONEY, M.D., B.S. LOND.,
HEAD OF THE X RAY DEPARTMENT, FULHAM MILITARY HOSPITAL.

I WISH to point out the very close connexion there is between hyperactivity of the thyroid gland and the tachycardia and breathlessness seen in cases of "irritable heart" and "soldier's heart." This association is a most important one, since the thyroid gland is eminently amenable to treatment.

These cases of "irritable heart" conform to slight cases of Graves's disease. The pathological condition of the thyroid gland in Graves's disease shows the gland cells irregularly massed, no regular acini, but a mass of actively secreting cells, pointing to some bacterial or other stimulus. This degeneration may occur in a gland which is not enlarged.

There are probably several chemical substances secreted by the thyroid; these different substances may produce the different varieties of the disease, but they are all derived from the thyroid. This is proved by submitting such cases to X rays in order to atrophy the gland. The gland can be reduced to any required and regulated extent, with the result that as the gland grows smaller all abnormal symptoms disappear and the man is fully restored to health. Malignant cells which are actively growing are some of the most easily atrophied by X rays; glandular cells are also readily affected. The thyroid gland in exophthalmic goitre is much more easily affected by X rays than the thyroid of a quiescent bronchocele, which may be explained by the glandular cells in exophthalmic goitre being in a very active condition.

We know the thyroid is excited by mental stress and danger, fright being a not infrequent cause of the onset of Graves's disease. Such conditions are produced in a very severe degree by the war strain—by the responsibility, the danger, the noise, sudden explosions near by, with the accompanying horror and nervous shock, and the constant strain on the attention, added to severe physical strain. History tells us that for years after the Franco-German War the people who remained under the German heel in Alsace-Lorraine were to a marked extent subject to exophthalmic goitre. There are many cases of shell shock which show no signs of Graves's disease, and where one can only suppose the thyroid has not been adversely affected; but other cases show symptoms of hyperthyroidism definitely dated by the patient as commencing only after one such definite shock, or after burial by an explosion.

The tendency to thyroid degeneration is one which runs in families, hyper- and hypo-thyroidism appearing in different members of the family, or in

the same individual at different times; that is, the gland in some families shows marked inability to withstand adverse conditions—it is unstable, and if exciting causes such as overwork, overworry, or pyorrhœa occur, then it degenerates. There are other causes besides nerve strain which help to cause the actual degeneration of the gland. The fact that one cause is to be sought in toxins from the alimentary canal is proved by Sir Arbuthnot Lane, who cures these cases through stopping intestinal stasis by his operation of short circuiting. It is noteworthy that dental caries, tartar, and pyorrhœa alveolaris are, or have been, present very commonly in these cases, but not universally. The thyroid condition persists after all the teeth are extracted; but in X ray work I have found those patients who have had their mouths thoroughly cleansed respond very much more quickly to treatment than those in whom constant oral sepsis persists. I therefore think there is a large probability that pyorrhœa is a common source for the causal germs, though not the only one.

Early cases, such as we are seeing in the base hospitals as a result of the present war, are often unrecognised as to their true nature; above all, the connexion of the various groups of symptoms with changes in the thyroid gland and the importance of this connexion are unrecognised. The result is that these cases drift on for months and months. The patients are often looked upon as being the subjects of shell shock or as neurasthenics, or sometimes as cases of early phthisis, and are sent out much in the same condition as when they came in, to pass almost at once into some other hospital.

That X rays, when properly and vigorously applied, are a specific for exophthalmic goitre I am quite convinced. I have treated these cases with X rays during the last seven years, and the results are most cheering. I have taken over the leavings of both surgeons and physicians, and enabled patients to resume an ordinary healthy life. One thing which cannot be cured is the heart which has been overstrained and dilated for several years; it never becomes quite as sound as it was before, the heart muscle remaining weak, so that the organ is more easily overstrained again than a healthy heart. But I have known patients lying up for weeks in hospital and at home who did not improve, or very slightly, and who did get well with X rays even in the adverse conditions of long daily toil. Some of my old cases come back to me for a couple of X ray exposures when they feel run down and in need of a tonic. I have seen several cases labelled "debility" or "neurasthenia" that were really slight cases of hyperthyroidism which did not respond to ordinary medicinal treatment, but which got rapidly well when the thyroid gland was made a wee bit smaller.

Exophthalmos is often a late symptom in this disease of the thyroid gland, and goitre may never be present.

Many cases with simple enlargement of the thyroid (bronchocele) show no symptoms of hyperthyroidism for a long period, as there is no excess of thyroid secretion into the blood; but a time comes when some of them begin with tachycardia, tremors, &c., indicative of a further change in the gland, and the pathological finding in such cases is that besides the ordinary colloid and gland cells found in every bronchocele there are areas which show alteration of tissue exactly similar to that found in the gland in exophthalmic goitre, evincing that the symptoms of hypersecretion are not due to the bronchocele but to the secondary degeneration of the gland. Thus, one may speak of Graves's disease or hyperthyroidism which is either (*a*) primary or (*b*) grafted on to a pre-existent bronchocele. I have now treated over a hundred cases which include both these groups.[1] Most of the cases in the present war are primary, no goitre having been present apparently before enlistment. There are several groups into which these early cases of hyperthyroidism fall according to which symptoms are the more prominent.

*Group 1.*—Tachycardia. This is perhaps the most usual group met with. These patients come in for breathlessness or fainting, often quite definitely associated with the effects of some particular shell which has burst in their near neighbourhood or shortly after they were buried by some explosion, and they say quite definitely that they were all right until that sudden great strain. Some have been rendered unconscious by the shell; others have not had such a severe shock. Some have found the strain of training too great, and have been much exhausted by the long marches or other heavy physical work. They suffer from giddiness and weakness. The heart-beats are most characteristic: the frequency may be normal or only slightly quicker than normal when lying down, but on sitting or standing the rate goes up to 90-100 or over, only to quiet down again by several beats on resuming the recumbent posture. The heart is often dilated. A skiagram shows dilatation of the right auricle and rounding of the ventricles. The action is tumultuous. The first sound is short and wanting in tone; this is its main characteristic. The heart may be irregular in force and rhythm, showing poverty of cardiac action. Any murmurs present, though often attributed to valvular disease, are hæmic or come from incompetence due to over-distension and disappear when the heart becomes quiet, unless there has been previous endocarditis from some other cause, such as rheumatic fever. The pulse is markedly collapsed between the beats. There is no œdema of the legs till late in the disease when the heart is failing. Such heart failure, with œdema, is seen in civil practice where the heart muscle has been overstrained for years and is consequently degenerated, but is not seen in these slight early cases, the product of this present war. These patients feel very weak; they suffer from dyspnœa, præcordial pain, palpitation, giddiness, and fainting. Even after treatment, when the heart has resumed its normal beat, the skiagram shows a rounded condition of the whole organ.

*Group 2.*—Manifest marked perspiration, and tremor which becomes more marked on the least effort or excitement. The tremor is a fine movement of the hand or may be general, or it may show itself in larger jerky twitchings of the muscles.

*Group 3.*—This group exhibits mainly nerve symptoms. These patients tell you their nerves "have gone to bits," and they are put down as cases of shell shock; but besides the effect that shell shock seems to have on the higher cerebral centres, there is this definite action, which it may have, of upsetting the thyroid gland. These patients are "jumpy" and twitch, they have bad dreams, they sleep badly, the pulse becomes unduly rapid on the least excitement, they dread everything. The medical attendant says they are neurasthenics, but what is meant by this word, and what is the underlying physical condition? Does it not mean hyperthyroidism, whether due to loss of nervous control, nervous exhaustion, or from intestinal toxin, or other cause?

*Group 4.*—This group shows enlargement of the thyroid as the first sign. This is soft and bilateral in early cases, and may or may not have been noticed by the patient before admission. The swelling is only unilateral where there has been previous benign bronchocele. This enlargement may be so slight as only to be evident when the patient puts his head well back so as to stretch the sternomastoids, and then the fullness becomes evident.

*Group 5.*—Eye symptoms. Exophthalmos may be the first thing noticed. The absence of wrinkles on the forehead and v. Graefe's sign of jerking lids are more common.

As the cases progress more and more symptoms from the above groups gradually develop. By the time the patient reaches the base hospital two or more groups are usually present, and even then the

[1] See THE LANCET, August 10th, 1912, p. 375, 48 cases reported by me; also Brit. Med. Jour., August 31st, 1912.

true nature of his condition may not be recognised. Common combinations are: tremors, nerves shaky and skin moist; or breathlessness, tachycardia, weakness, and sweating; or nervous twitchings, no wrinkles in the forehead, with raised pulse-rate—in fact, the above five groups may be combined in any proportion. These cases also show some general conditions: they lose weight, feel "good for nothing," are despondent and irritable, and worried by small causes. Nearly all are constipated, though the bowels may be relieved daily, and most of their mouths exhibit various degrees of pyorrhœa and of dental caries.

*Treatment.*

Of methods of treatment there are three: rest and medicine; surgical treatment; and X ray treatment. If complete success is to be obtained, the general condition of the patient must be attended to, as well as the local affection.

*X ray treatment.*—This does not deal with the primary cause of the disease, but cures the patient. It is the way *par excellence* to lessen the thyroid gland to any desired extent. The points about this treatment are the following: 1. There is no shock or danger to life as in operation. 2. The reduction in the activity of the gland can be carried on to any desired extent, so as to bring the secretion back to the normal amount. Beyond this myxœdema would be caused, therefore one has to be careful not to go too far. X rays are much more accurate than operations on the neck, as the dose is adjusted exactly to fit each case. 3. There is no pain or unpleasantness. The patient merely lies on a couch and has the X rays applied to each side of the neck over the gland; he does not feel anything and sometimes goes to sleep during the treatment.

One disadvantage of X ray treatment is that it requires several sittings spread over a couple of months or more according to the severity of the case. The length of treatment depends on many conditions; the more X rays are pushed the quicker the patient gets well.

In hospital these soldiers are ideally placed to get well. They are away from their original source of worry and nervous shock, they are well fed and cared for, and they can take rest to allow the heart to recover tone; they are, moreover, away from home worries, and have no daily duties which must be done no matter at what cost to themselves.

Besides having the secretion of the thyroid diminished, these patients require their health to be built up in every way possible. One serious source of delay is that it takes on an average from six weeks to two months to get their mouths cleansed, which is a great, almost an essential, help to treatment. In many cases some pyorrhœa is left behind, which hinders the cure. Another point to be attended to is either thorough abdominal massage or daily aperients to overcome the universal intestinal stasis, of which the patient does not complain, but which is always present. Rest is useful to restore the weakened heart, but I do not keep my patients constantly in bed except where such weakness is very acute; many of them have had months of bed without result before coming to me and are thoroughly weary of it.

The treatment I pursue is to apply the X rays as vigorously as is compatible with safety to the skin. At first I did not filter and got much mild dermatitis, now I give much bigger doses filtered. One Sabouraud dose through one or two millimetres of aluminium as a filter to each side of the thyroid weekly requires about 20 minutes. The results are in some cases slow, in others astonishing. A languid, tired, irritable, jumpy patient gains week by week in mental quietude, gets better tempered, more placid, and feels better and stronger; sleep, digestion, and pulse all improve, and he gains weight. The heart is one of the earliest organs to respond; it first becomes regular, then slows down and resumes its normal size while regaining tone in the first sound. The throbbing in the carotids disappears and there is a strong, full, regular pulse, steady and quiet even in the upright position, though for some weeks longer any excitement or emotion raises the rate. After some time exophthalmos is no longer evident, rarely does it persist. The goitre first becomes softer and then diminishes in size till the neck becomes normal. Even patients who do not show much improvement while undergoing the rays show marked improvement a few months later. The only risk is of temporary pigmentation of the skin which may even go on to slight dermatitis, and later in a few cases to telangiectasis.

The treatment requires much patience and attention to detail on the part of both practitioner and patient, but the good results obtained are quite worth the time and trouble spent, and if more widely used would bring many back to health who now drag on an existence for many months in miserable weakness and ill-health. The difficulties are the time required, and that patients feel so much better that they are apt to be discharged before being fully cured.

The main facts I wish to lay stress on are the following. 1. Fine tremor in a young man is not normal; a healthy soldier returned from the front does not so tremble. 2. Excessive perspiration with tremor is not normal. 3. Great nervousness, dread, and jerky twitchings are not normal. 4. A pulse habitually over 90 is not normal. 5. The condition called "soldier's heart" and "irritable heart" must be caused by something. These are not psychical conditions, to be looked at and labelled, but beyond the reach of help. No; they are one and all suggestive of oversecretion of the thyroid gland, and when so caused can be cured by partial atrophy of the gland. If seen early they can quickly be cured; if left for months they take longer; but they can be cured as certainly as an abscess is cured by opening and draining it.

The following are notes of four cases at Fulham Military Hospital:—

CASE 1.—Private, aged 22. Perfectly well until he enlisted on June 6th, 1915. He felt greatly exhausted while training, finding the long marches especially trying. On July 23rd he was sent to Fulham Military Hospital suffering from "breathlessness and tachycardia." He was kept entirely in bed, but at the end of six weeks there was no improvement. He was intensely nervous, weak, and pale. A skiagram showed a rounded, tumultuous heart.

When I saw the patient I diagnosed hyperthyroidism of the nervous and cardiac types. On Sept. 4th I started X ray treatment to the thyroid. I did not keep him wholly in bed. He showed slight fullness of the neck, there was no pyorrhœa, he was very breathless, his pulse recumbent was 136, and he was so scared and nervous that I could hardly get him to lie quietly on the couch for the first treatment, though later he came willingly. During the next week he had his second treatment; he was still breathless; pulse 104 recumbent. On Oct. 18th, after seven treatments, he was sent on furlough for a month; therefore X rays were stopped. His neck was three-eighths of an inch smaller; there was no dyspnœa or tachycardia; he felt strong and was able to be up all day, and in manner was very much quieter. All this was accomplished in six weeks.

When seen one month later the patient was back at his depôt. He told me he was so well that he could not get his discharge from the army. He was slightly nervous in manner, the pulse standing was 72, all other symptoms were completely gone, his weight had gone up, and he felt strong

and well. He went out rather too soon, and runs some risk of relapse in consequence.

CASE 2.—Private, aged 25. In France from November, 1914, to April, 1915; through Ypres and Neuve Chapelle; sent home in April, 1915, for rheumatism, bronchitis, and frost-bite. On Sept. 2nd he entered Fulham Military Hospital, and was said to be neurasthenic. Weight 8 st. 10 lb. He perspired, had headache, the eyes were misty, but vision was normal; he was losing weight, but his collars had been tight of late.

An X ray examination showed the rib cartilages ossified, and the heart small, rounded, and tumultuous. On Oct. 18th the note of Dr. R. McNair Wilson was: "High blood-pressure, marked vaso-motor symptoms, no gross cardiac lesion, nervous, toxæmia." On Oct. 25th the patient's medical attendant, Dr. R. Dainty, and I agreed that the symptoms were really due to hyperthyroidism, so I started X ray treatment. The patient then had fine tremor, perspiration, pyorrhœa; the pulse was irregular in force and rhythm, 92 recumbent; there was slight goitre. Nov. 11th: Third treatment. Pulse regular, 76 recumbent, pyorrhœa still, goitre less, no tremor, no perspiration, felt better. On Dec. 16th the patient had had seven treatments, delayed by dermatitis. Jan. 8th, 1916: No further treatment. The dermatitis had disappeared. The patient had improved very markedly since the treatment began, and had recovered a healthy condition. He was no longer depressed and good for nothing, and was feeling strong —"better than before Neuve Chapelle." He weighed 9 st. 9 lb., and the pulse was regular, 80 standing. The headaches, tremor, and perspiration had all disappeared, and the patient was able to run without getting unduly out of breath; the goitre had disappeared, and the neck measured one inch less than when X rays were begun, two and a half months previously. The case had responded very well to treatment, and the patient has now returned to his regiment.

CASE 3.—Private, aged 31. In France from November, 1914, to May, 1915. He was buried by the explosion of a shell. Complained of sore feet and excessive perspiration in April, 1915. Admitted to Fulham Military Hospital in June, 1915. He was sent to me to be treated for very excessive perspiration, chiefly in hands and feet. Local treatment did not succeed, and I noticed that the pulse varied from 68 to 100, while he had distinct fine tremor, I therefore changed the treatment to giving X rays over the thyroid gland. After five treatments the tremor was gone and the perspiration had much diminished. The pulse was 80 standing. The patient was discharged, but he would have been better with a few more treatments.

CASE 4.—Private, aged 21. In France from October to December, 1914; sent home wounded. In France again from March to October, 1915. Admitted to Fulham Military Hospital on Oct. 9th, 1915, the case being diagnosed as "palpitation and disordered action of the heart." The patient had suffered from palpitation for four months, which had gradualiy been getting worse, from shortness of breath, and from dizziness and headache. Oct. 26th: Præcordial pain. The heart-beats were hurried, the pulse-rate was 96, and there was fullness of the neck suggesting enlargement of the thyroid. It was decided to adopt the X ray treatment. First treatment: Condition as above. No heart murmurs. Pulse 104, regular; goitre large, soft, and uniform; the neck measured 14 inches. Tremor and perspiration were present—palpitation frequent. Nov. 9th: Third treatment. The patient felt better and the heart was quieter; pulse 100. Dec. 16th: Eighth treatment. Only one attack of palpitation during the last week; goitre smaller, 13¾ inches; tremor nil; pulse 88 standing. The patient's medical attendant considered him to be a great deal better. Dec. 29th: Tenth treatment. Occasional palpitation; perspiration and tremor gone; pulse 92 standing; goitre 13¾ inches, almost disappeared; no dyspnœa, dizziness, or headache; occasional pain in the chest still. The patient was up and about all day. The septic teeth and digestive trouble had delayed this case. After a month in a convalescent home the patient has returned to his regiment and is reported to be quite well.

I am now treating with X rays over 20 cases of tachycardia or shell shock each week, and several patients have already been discharged back to their regiments.

I am indebted for the above cases to the kindness of the other medical officers of the Fulham Military Hospital who have allowed me to treat their patients, and especially am I grateful to our commanding officer, Major C. T. Parsons, R.A.M.C., for his constant help and interest in everything which concerns the department.

Nottingham-place, W.

# Medical Societies.

## ROYAL SOCIETY OF MEDICINE.

### SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

*Exhibition of Cases, Tracings, and Specimens.*

A MEETING of this section was held on March 24th, Dr. R. HUTCHISON, the President, being in the chair.

Dr. HUGH THURSFIELD showed a case of Rickets in a girl aged 2½ years, with old fractures of both clavicles, both femora, and both humeri, and recent fractures of right humerus and left fibula and tibia. She had marked rickety deformity of the thorax.

Dr. H. C. CAMERON showed a case of Osteogenesis Imperfecta in a girl aged 5 months. Three other children in the family. No history of fractures in any relatives. Born at full time. The baby was small, though not ill-nourished. On admission there was tetany of the hands, and the spasm could be made very marked by rendering the hand cyanosed by the pressure of an elastic band around the upper arm. In a few days this disappeared. Until admission the baby was breast-fed. The shape of the skull was typical. The bones of the skull generally were very thin, and in many places yielded on pressure. The ossification was most defective in the lateral parts of the skull, which were formed largely in membrane, forming persistent lateral fontanelles of considerable size. The skull presented a superficial resemblance to that of hydrocephalus of mild degree. The limbs were somewhat curved and a little short. A thickening due to callus could be felt in the shaft of the right femur. The sclerotics were somewhat blue.

Dr. J. L. BUNCH showed, amongst others, a case of Papulo-necrotic Tuberculide.

Dr. J. D. ROLLESTON showed a case of Transient Hemiplegia in Diphtheria and Diphtheritic Onychia. The patient, a boy aged 5 years, was admitted to hospital on Oct. 6th, 1915, with severe faucial diphtheria on the third day of disease. 20,000 units of antitoxin were given on admission, 16,000 on the 7th, and 12,000 on the 8th. The throat became clean on the 11th. An urticarial rash appeared at the injection site on the 12th, and persisted till the 15th. The same day the heart, hitherto normal, showed some slight left-sided dilatation and an occasional extrasystole, and the child vomited. On the 16th triple rhythm developed and the liver became enlarged. On Nov. 2nd the voice became nasal. On the morning of the 3rd, the thirty-first day of disease, a circinate rash appeared on the limbs. Temperature 97·8° F. During the day the patient complained of abdominal pain, and at 10 P.M. became very pale and almost pulseless. At 1.30 A.M. the face, eyes, and arms twitched, and between 4 A.M. and 6.40 A.M. he had general convulsions. At 11.20 A.M. he was found to have complete loss of power in the right upper and lower extremities. There was slight facial palsy. The right abdominal reflex was less marked than the left. Both plantar reflexes were flexor. There was no ankle clonus. The knee-jerks were absent. He seemed to understand what was said to him, but could not speak. The left index, middle, and ring fingers each showed a bulla on the terminal phalanx. At 7 P.M. he had recovered some power in the right upper limb, but the lower limb was still paralysed. The right plantar reflex was now extensor. He could now speak a few words. On the following morning he had quite recovered his speech and could move his right arm and leg freely. The right plantar reflex was still extensor, but became flexor the next day. The voice remained nasal until Nov. 29th, but no other nervous symptoms developed, and when he was allowed up on Dec. 3rd, the sixty-first day of disease, he could walk without support. In spite of a variety of local applications the lesions in the fingers showed no tendency to heal, but sloughing took place, especially in the middle finger. No membrane was seen at any time. There was no constitutional disturbance nor any rise of temperature. On Jan. 19th, 1916, a culture taken from the lesion on the middle finger showed numerous groups of diphtheria bacilli, and 8000 units of antitoxin were injected. Within a week the lesions, which had been in existence for two and a half months, had completely healed.

Dr. E. B. GUNSON showed a case of Gangrene of the Leg following Diphtheria. The patient, a boy aged 6 years, was admitted to hospital on Jan, 5th, 1915, with severe faucial diphtheria on the fourth day of the disease. He was given 20,000 units of antitoxin on admission, and again on the following day. On the seventeenth day the pulse became markedly irregular, the onset of arrhythmia being followed by marked increase in cardiac and liver dullness. On the eighteenth day there was a sudden onset of acute pain, referred to the right popliteal space. On the following day a ring of discolouration appeared below the knee and the leg became cold. Gangrene of the right small toe and outer aspect of the foot developed on the twenty-second day, and gradually involved the whole of the leg below the level of the knee-joint. Sloughing of the skin appeared at the line of demarcation on the forty-ninth day. Palatal, pharyngeal, and diaphragmatic palsies developed during the fifth and sixth weeks. Amputation of the right leg was performed by Mr. H. S. Clogg, the patient ultimately making a complete recovery.

Dr. C. O. HAWTHORNE showed tracings of a case of Rapid Respiratory Rhythm apart from other Evidence of Disease. The patient, a girl aged 8 years, was under observation in hospital for some six weeks, and no evidence of organic disease was discovered. The respiratory rate was constantly quickened (60 to 80 per minute), and occasionally exceeded the pulse-rate; when the child was asleep, however, it fell to 20 to 25. There were no other symptoms, and save for the rapid breathing the child seemed to be in a normal state of health. When she left the hospital the respiratory rate was about 40 per minute.

Dr. E. A. COCKAYNE showed a case of Paroxysmal Hæmoglobinuria. The patient, a boy, lived abroad until March, 1915, where he suffered slightly from malaria. There was a history of a miscarriage before he was born, and of a still-born premature child two years ago. The first attack of hæmoglobinuria occurred the day after landing in England. He was free in the summer, but in the autumn with the onset of cold weather attacks had occurred fairly often. Previous to the attack the ears and feet felt very cold, but there were no definite phenomena of Raynaud's disease. The child was thin and very anæmic. No definite stigmata of congenital syphilis. The urine during an attack was coffee-coloured and contained hæmoglobin and methæmoglobin, but no red corpuscles and no casts. The Wassermann reaction was strongly positive.

Pathological specimens were shown by Dr. ROLLESTON and Dr. H. C. CAMERON.

## ROYAL ACADEMY OF MEDICINE IN IRELAND.

### SECTION OF MEDICINE.

*The Soya Bean (Glycine Hispida) and its Uses in Physiology and Medicine.*

A MEETING of this section was held on March 3rd, when Dr. W. G. SMITH read a paper on the Soya Bean (*Glycine Hispida*) and its Uses in Physiology and Medicine. Attention was drawn to its important dietetic and economic applications, which admit of considerable extensions if its cultivation be extended in our colonies, especially in South Africa. The seeds are free from starch and sugar and have been utilised in the treatment of diabetes. The chief topic of the paper referred to the striking discovery by Takeuchi, a Japanese *savant*, that the bean contains a specific ferment, urease, which rapidly converts urea into ammonium carbonate. The general principles of enzyme action were briefly mentioned, and the modes whereby they operate. The relations of ordinary urea to ammonium cyanate and of sulphur urea (thio-urea) were discussed, and the mutual reversibility of the process in each case was experimentally shown. The almost immediate influence of urease in converting urea into ammonium carbonate was demonstrated, and it was pointed out that urea had recently been discovered in a number of plants, up to as much as 3·5 per cent. in a fungus. A practical point in connexion with urease is its application to the quantitative estimation of urea. The most rapid methods of estimation for routine work are: (*a*) The hypobromite method. (*b*) Folin's process with $MgCl_2$ and HCl. (*c*) The most accurate method is by urease. The ammonia is absorbed by decinormal sulphuric acid.

Dr. T. P. C. KIRKPATRICK asked whether the estimation of urea could be carried out in clinical work, or must the urea be in a pure state.

Dr. A. R. PARSONS complimented Dr. Smith on the clearness with which he had dealt with a somewhat abstruse subject. He could confirm the almost invariable presence of starch in so-called "diabetic foods"—he had once found as much as 60 per cent.—and thought soya bean might prove very useful in this respect. He was very glad to hear of this method of estimating urea, as he had found the hypobromite method unreliable. He would like to know how urease was prepared commercially, and where it could be obtained.

Dr. J. CRAIG said that soya bean had been in use as a cattle food for some time. In some cases cattle had died in a rather mysterious way, and he would like to know whether urease could act on any other nitrogenous substance.

Professor A. E. METTAM asked whether the term "glycine" indicated any connexion with the substance glycin which combined in the kidneys with benzoic acid to form hippuric acid.

Sir J. W. MOORE recalled the fact that a proportion of carbohydrate in the diet was very desirable in diabetes.

Dr. SMITH, in reply, said that the estimation of urea by urease was quite applicable to clinical work, and was, in fact, a very simple and easy method. In the case of cattle urine an estimation was afforded of the allantoin nitrogen also. He considered the name "glycine" quite independent of any other similar term.

### SECTION OF PATHOLOGY.

*Exhibition of Cultures and Specimens.*

A MEETING of this section was held on Feb. 18th, Dr. R. J. ROWLETTE being in the chair.

Dr. W. D. O'KELLY exhibited cultures which were prepared in connexion with the work he was carrying out under Professor E. J. McWeeney for the Medical Research Committee. They illustrated the culture points of differentiation between the bovine and human types of tubercle bacilli. He fortunately succeeded in making direct cultures on the egg medium, thus getting over the difficulty of isolating the organisms without animal inoculation. The only difficulty now was to secure the material uncontaminated; if this were obviated a high percentage of successful direct cultures should result.

Mr. R. M. BRONTË exhibited cultures of tubercle bacilli of human, bovine, and avian type.

Dr. W. BOXWELL showed organs removed from a female patient aged 28, on whom Mr. Henry Stokes had previously performed an operation for the cure of ectopia vesicæ. After removal of the uterus, the ureters had been successfully transplanted into the rectum, and for some time the patient had done very well. Subsequently, however, one of the ureters had broken loose from its new point of attachment, probably, as Mr. Stokes had suggested, through ulceration, due to defective blood-supply in the button of mucous membrane left around the end of the transplanted ureter. A pelvic abscess then formed which opened into the vagina, through which urine was thenceforward voided. The patient ultimately died three months after the operation from ascending pyelonephritis in both kidneys. The interest of the exhibit mainly lay in the relative rarity of this malformation in a female, and in the condition of the surviving ureteral papilla in the rectum. This was quite pervious, and apparently firmly attached, but was in a condition of superficial necrosis, all the transitional epithelium having perished with the exception of one tiny shred on its mucous surface, as shown in microscopic sections. This patient had passed for a boy until the date of the first operation, and neither she nor her people were ever disabused of this impression. She had a slight boyish figure, rather hairy arms and legs, and a deep-toned voice, but the total absence of circumoral hair and well-developed breasts of a woman.

Professor A. E. METTAM showed a specimen of Spontaneous Tuberculosis in a Rabbit.

Dr. J. H. POLLOCK showed specimens of Melanotic Tumour, Metastases in Lungs and Liver, and Portal Thrombosis and Cirrhosis in latter.

Dr. T. T. O'FARRELL showed a Stomach removed post mortem which exhibited two ulcers in the fundus and a carcinoma at the pylorus.

LIVERPOOL MEDICAL INSTITUTION.—A meeting of this society was held on March 9th, Major Charles J. Macalister, the President, being in the chair.—Mr. C. A. A. Dighton related a case of Sarcoma of the Nose and Nasopharynx. The tumour was removed under chloroform in September, 1914. The operation performed was a sub-labial lateral rhinotomy, and in addition a wedge-shaped section of the upper jaw and palate was removed. The patient was shown. She was healthy and there had been no recurrence.—Dr. F. H. Barendt read an amusing and interesting paper on the Use, Misuse, and Abuse of Soap. He described the various pharmacopœial preparations of soap and discussed their relative value. In his opinion far too much soap was used, he said.—The President and Major Rushton Parker both joined in the discussion.—Captain T. R. W. Armour read an interesting paper on Military Orthopædics, in which he divided these cases into two groups: (1) Disabilities occurring in men under training, such as cases of flat feet, hallux rigidus and valgus, pes cavus, internal derangement of the knee, hysterical deformities of hip and spine, sprains, and old fractures; (2) cases due to wounds or other injuries received on active service. Captain Armour described a series of deformities produced by fractures of the femur, fractures involving the shoulder, elbow, wrist, and hand, injuries to muscles and nerves, and showed several radiographs illustrating the cases. The principles underlying the treatment of each case were discussed and progress described. Reference was made to the value of active exercises carried out under proper supervision as part of the treatment, and the necessity for getting the men to take intelligent interest in their own cases. Several points were brought forward with regard to the adaptability of stumps for the application of artificial limbs.—The paper was discussed by the President, Major Rushton Parker, Mr. G. P. Newbolt, Mr. F. A. G. Jeans, and Captain J. Lloyd Roberts.

LONDON DERMATOLOGICAL SOCIETY.—A meeting of this society was held at St. John's Hospital for Diseases of the Skin on March 21st, Dr. J. L. Bunch, the President, being in the chair.—The President showed, among other cases, a Belgian with a mixed large and small Follicular Syphilitic Eruption on the Trunk of three to four months' duration; the patient also had an atrophic scarring on the left eye, caused by a shell. A most successful transplantation had been performed in this region.—Dr. Morgan Dockrell showed a case of Idiopathic Multiple Hæmorrhagic Sarcoma which had greatly improved under thyroid extract and streptococcal vaccines. He also exhibited a case of Perforating Ulcer in a man who had received nine injections of salvarsan without any appreciable result. The condition was steadily improving under mercurial treatment.—Captain W. Griffith, R.A.M.C., showed a case of Pustular Folliculitis affecting the legs and thighs which had been treated by the Simpson light.—Dr. W. Knowsley Sibley showed, amongst other cases, a girl, aged 16, who had a rather unusual ulceration on the front of both legs, due to sitting before the fire.—Major E. G. Ffrench, R.A.M.C., showed a case of Strumoderma in a youth, the lesions occurring on the face and neck, which had been somewhat improved by applications of the Simpson light.—Captain C. H. Mills showed a case of Syphilis on an old-standing psoriasis. The patient also had a peculiar horny growth on the umbilicus.

MEDICAL MAGISTRATES.—Mr. Barclay Josiah Baron, M.B., C.M. Edin. (the Lord Mayor), and Mr. Colston Wintle, L.R.C.P., M.R.C.S. (chairman of the Health Committee), have been placed on the commission of the peace for the city of Bristol.

THE "STAR AND GARTER" HOME.—The following will act as the consulting staff at the "Star and Garter" Home for Totally Disabled Soldiers and Sailors:—Consulting physician, Sir David Ferrier, F.R.S.; visiting physician, Dr. S. A. Kinnier Wilson; consulting surgeon, Mr. Wilfred Trotter; consulting urologist, Mr. J. Thomson Walker; consulting ophthalmic surgeon, Dr. A. C. Hudson; honorary dentist, Mr. Donald Campbell; honorary surgeon, Mr. Harry Wade.

# Reviews and Notices of Books.

*The Treatment of Acute Infectious Diseases.*

By FRANK SHERMAN MEARA, M.D., Ph.D., Professor of Therapeutics in the Cornell University Medical College in New York City, &c. New York: The Macmillan Company. 1916. Pp. 540. Price 15*s.* net.

IN regarding the group of infectious diseases from the point of view of the therapeutist we might endeavour to divide them into two classes—those for which some specific remedy has been discovered, and those for which none such has so far come to light, and in which, therefore, we are reduced to the practice of merely expectant or symptomatic treatment. We might again subdivide the former class into those, on the one hand, for which some recognised chemical compound or drug is efficacious, and those, on the other, for which some product of vital reaction is brought into play by the use of a serum or vaccine. Hitherto only malaria and syphilis appear susceptible to specific drug treatment, unless the use of emetine in dysentery or of the salicylates in rheumatic fever may be regarded as specific; while the list of diseases for which treatment by serum or vaccine is uniformly successful would narrow itself down to diphtheria, and perhaps tetanus, gonorrhœal septicæmia, and cerebro-spinal meningitis, to which must be added, if prophylaxis is classed as treatment, small-pox, enteric fever, and hydrophobia, and possibly plague and cholera, for all of which preventive vaccination has varying claims to our regard.

The book before us does not attempt any such classification but proceeds on ordinary lines, the diseases being merely arranged in the order which appeals to the author. The list includes rheumatic fever and leprosy, but not acute generalised tuberculosis or gonorrhœa or syphilis. The first two chapters deal with the symptoms of infection such as pyrexia and with the methods of combating them, and with the diet suitable to febrile conditions, which the author urges should be more liberal than is usually considered advisable, in order to make up for the wasting that accompanies toxæmia. He holds that after the first few days the digestive system resumes its activity and can deal with a considerable quantity of suitable food. Plenty of water is also called for. The diseases are then considered separately in full detail, the method involving a good deal of repetition, but being perhaps convenient for rapid reference. Among the advice given we note that the author is not in favour of the use of alcohol in febrile conditions—advice which is very usually founded rather on theory and prejudice than on observation of the effects produced by the drug. He speaks highly of the rectal administration of salicylates in rheumatism, and also of their employment by intravenous injection. He upholds the bath treatment of enteric fever, which has never made much progress in this country, but seems to be largely employed in the United States of America.

The fullness of the advice given as to the treatment of the various diseases should render this book acceptable to practitioners who are called upon to deal with them, and the counsel given is throughout sound and practical. Doses are given both in apothecaries' weights and measures and in the metrical system. A few mistakes are noticeable, as, for example, in placing vaccine treatment

of rheumatism under "complications" of that disease, and in the sentence (p. 500) "glowing accounts of vaccines (*sic*) have followed the use of Hiss' leucocytic extract," in which the word vaccines appears to take the place of some term such as "successes." There are few typographical errors, and the book is well got up and adequately indexed.

## JOURNALS.

*The Journal of Physiology.* Edited by J. N. LANGLEY, Sc.D., F.R.S. Vol. L, No. 3. Cambridge: University Press. February, 1916. Pp. 157–216. Price 4s.—The Mechanism of Fluid Absorption from Tissue Spaces, by F. H. Scott. It is well known that the volume of the blood rapidly increases after hæmorrhage, which is due to the passage of fluid from the tissue spaces back into the blood capillaries. The change is rapid and cannot be accounted for by lymph flow. Indeed, it occurs after the thoracic duct is ligatured and after the intestines have been removed. Two theories have been put forward to explain this absorption of fluid: the backward-filtration theory of Landerer (1884) and the osmotic theory of Starling (1896). In the first theory it is assumed that when the pressure in the capillaries falls below that in the tissue spaces the fluid is forced back into the capillaries. According to Starling, there is normally a balance in the production and absorption of tissue fluid between the filtration pressure in the capillaries and the osmotic pressure of the colloids of the blood and tissue fluid. Plasma and tissue fluid are practically identical in their composition in everything except protein. The blood proteins exert an osmotic pressure of about 4 mm. of Hg for every 1 per cent. of protein. Since the plasma contains more protein than the tissue fluid its osmotic pressure is greater, and this greater osmotic pressure should cause an absorption of fluid when the capillary pressure is reduced. It seemed possible to the author that a comparison of the protein content of the blood before hæmorrhage and a short time after it might throw light on the nature of the fluid passing into the blood. The author determined the protein content of the fluid entering the blood-vessels after hæmorrhage in three cases in dogs. Experiments were also made in the blood of the living animal diluted with Ringer's fluid. The salt solution rapidly leaves the blood for the tissue spaces, so any backward filtration is excluded. The author finds that as large or larger increases in the nitrogenous bodies of the plasma occur after injecting Ringer's fluid (when all backward pressure is excluded) as occur after hæmorrhage. After hæmorrhage the fluid passing back into the blood must contain less protein than the plasma, whether it passes back by osmosis or by filtration; it will then necessarily cause protein to pass from the cells into the plasma. An increase of protein in the plasma after hæmorrhage is no evidence of backward filtration, and is consistent with Starling's view that the fluid passes into the capillaries by osmotic action. The author's results are grouped as follows: (1) After hæmorrhage an increase occurs in the total protein of the blood plasma, corresponding to a total protein content of 0·6 to 2·09 per cent. in the fluid which has passed through the capillary wall from the tissue spaces to the blood; (2) injection of Ringer's fluid into the blood leads to a similar increase of protein, even though the injected fluid is leaving the blood for the tissue spaces at a rapid rate; (3) the increase of protein occurring after hæmorrhage may then be attributed to the passage into the blood of fluid from the tissues containing little, and possibly no, protein. The increase is not inconsistent with Starling's theory that the increase in the volume of the blood occurring after hæmorrhage is due to the osmotic pressure of its proteins.—Glycolysis in Diabetic Blood, with a Method for the Estimation of Blood Sugar, by Hugh Maclean. According to the author, the problem of the action of diabetic tissues on glucose is still unsolved, and the question of excessive excretions of sugar in the urine in experimental and ordinary diabetes seems as obscure as ever. Conclusive experimental evidence that in diabetes the tissues have actually lost, either wholly or in part, the power to oxidise glucose is difficult to obtain. Perhaps the said power is by no means lost. Indeed, there does not appear to be any conclusive evidence at present that the diabetic organism as a whole is less able to destroy sugar than the normal one. Evidence is gradually accumulating which points to a lack of power to store sugar in a stable form as a more likely fundamental cause of glycosuria than an ability to oxidise sugar. The heart of a depancreatised dog originally was said to be unable to utilise glucose, and the same obtains in a diabetic heart perfused with Ringer's solution containing sugar. Later experiments show that the heart of the depancreatised dog destroys sugar, as evidenced by the diminished reducing power of the liquid after passing through the diabetic heart. The results of the study of the respiratory quotient point in the opposite direction and would appear to indicate that little or no sugar is destroyed. Normal human blood is known to destroy sugar when incubated at 37° C. There is, however, great difficulty in the accurate estimation of the sugar in small amounts of blood. The author gives a full account of his new method of estimating sugar in blood, for which we must refer the reader to the original. The author finds that there is no decrease of glycolytic power in diabetic blood; if the mechanism of sugar oxidation in the blood is similar to that in the tissues, it must be inferred that the diabetic tissues also possess the power to destroy sugar.—Studies in Calcium Metabolism: I. The Deposition of Lime Salts in the Integument of Decapod Crustacea, by J. H. Paul and T. S. Sharpe. A crab before "moulting" refuses food, lives a very inactive life, and seeks shelter. A crab—in the stage called "Pillans" on the North-East of England—denuded as far as possible of its hard shell, does not increase in size as it does when the animal leaves its shell naturally. The integument becomes more leathery, but calcium carbonate cannot be demonstrated in it. Certain internal conditions must obtain if the very rapid deposition of calcium carbonate is to proceed. Different animals, however, vary considerably in the rate of deposition of calcium. The general results may be summarised as follows: 1. After moulting there is a rapid deposition of calcium carbonate in the shell of decapod crustaceans. 2. In the edible crab calcium phosphate is present in the hepato-pancreas to the extent of about 20 per cent. of the bulk of the gland immediately before moulting. 3. After the shell has hardened this calcium salt is practically absent from the gland. 4. The lobster does not store calcium in its gland as the edible crab does, but *Lithodes maia*, the stone crab, shows a slight storage. 5. Oil is present in the gland before moulting. It comprises from 20 to 50 per cent. of the total weight. When the shell has hardened it has almost disappeared, like the calcium salts. The iodine value is in inverse ratio to the quantity of oil and to the quantity of calcium. 6. The volume of blood is markedly increased immediately after moulting, even increased ten-fold. The total amount in circulation is greatly increased, although the percentage of calcium is practically constant. 7. Calcium is probably present in the blood as a salt of a fatty acid, and, since formic and butyric acids have been found to be present in combination with some base in the blood, they are to be regarded as the carriers of the metals. They are the members of the fatty acid group which most easily dissolve calcium salts.—Observations on the Nerve Endings, Receptive Substance and Contractile Substance of Muscle, by D. Noël Paton and Leonard Findlay. The conception that there is a "receptive substance," a peripheral neuromyal mechanism, a substance lying in proximity to the nerve ending, we owe to Langley. The action of curare on the muscles of the cat with nerve intact and then on recently denervated muscle was investigated. The authors think their results show that the "receptive substance" generally remains unaltered for some time after the nerve has ceased to act, and in this condition would give the results described by Langley with curare and nicotine. It is also possible that the "receptive substance" may in some cases have its excitability modified during the process of degeneration of the nerve, and the galvanic response characteristic of the reaction of degeneration may be the result of the degeneration of this substance.—The Cerebro-spinal Fluid. IV. Circulation, by W. E. Dixon and W. D. Halliburton. After epitomising their own work and that of other observers, the authors studied the effects of absorption from the cerebro-spinal fluid of various more or less easily detectable substances in the dog, and also absorption into the same fluid. Some experiments were made with dyes and pituitary extract. Amongst other results we note the following: 1. Substances introduced into the cerebro-spinal fluid appear rapidly in the blood and do not find exit by lymph channels. Readily

diffusible substances, especially if placed in the sub-cerebellar region, appear in the blood with remarkable speed. Adrenaline, nicotine, and atropine produce characteristic physiological effects almost as rapidly as if injected into the venous circulation. 2. Indiffusible substances—e.g., proteins—do not produce these characteristic effects when placed in the cerebro-spinal fluid. Secretin—of intermediate molecular size—diffuses slowly. The diffusion process is most rapid in the sub-cerebellar region and extremely slow in the lower spinal area. 3. The authors hold that it is by the blood and not by the lymph that the fluid which is constantly being secreted finds its main exit from the cranio-vertebral cavity. 4. Some evidence is presented that dyes—methylene blue, carmine, granular Indian ink, potassium ferrocyanide, and iron ammonium citrate, the tissues being subsequently treated with hydrochloric acid—added to the cerebro-spinal fluid, travel along the course of certain cranial nerves, especially the olfactory nerve. In the spinal nerves no dye can be detected in the sheaths outside the spinal cord, nor was dye found in the lymph of the thoracic duct. 5. Diffusion from blood to cerebro-spinal fluid does not occur except in an almost negligible degree with a few drugs—e.g., urotropine. The secreting epithelium of the choroid gland protects the tissue elements of the central nervous system from being bathed with harmful substances. 6. Pituitary extract has no direct action on the secretory activity of the choroid gland. Statements to the opposite effect can be explained by the non-exclusion of an asphyxial condition due to constriction of the bronchioles, which is a powerful stimulus to cerebro-spinal secretion.

## ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the committee held in March, 26 cases were considered and £207 granted to 20 of the applicants. The following is a summary of the cases relieved:—

Widow, aged 46, of M.R.C.P. Irel. who practised at Norwich and died in January, 1916. Applicant left totally unprovided for with four children, aged 5 to 19. The eldest has joined the army and the youngest are at school. Applicant's health is bad, and she has no friends. Voted an immediate grant of £5, pending further inquiries.—Daughter, aged 44, of M.D. Edin. who practised at Leamington and died in 1884. Applicant along with her mother managed, with the aid of the Fund, to get along by letting some of their rooms. The mother died recently, and the applicant was unable to manage without a little help. Voted £6.—Widow aged 68, of M.B. Edin. who practised at Bolton and died in 1905. Applicant lost about £700 through a defaulting trustee, since dead, and her only certain income is £10 per year. One daughter, a shop assistant, lives at home and helps as much as she can. Voted £12 in 12 instalments.—Widow, aged 62, of L.R.C.P. Irel. who practised in North London and died in February, 1916. Her late husband was a pensioner both of the Fund and Epsom College. Applicant has no income, and at her age expects it will be difficult to find work. Voted £12 in 12 instalments and referred to the Guild.—Widow, aged 61, of L.R.C.P. Irel. who practised at Mitcham and died in 1914 after a long illness during which all his savings were spent. Applicant is now practically dependent on the hospitality of friends. Relieved three times, £40. Voted £10.—Wife, aged 37, of M.R.C.S. Eng., is in an advanced state of tuberculosis, and her husband is in an asylum. There are three children; the eldest is being cared for by a relative, the second is in an orphanage, and the youngest living with the mother. Relieved once, £18. Voted £18 in 12 instalments, and referred to the Guild.—Daughter, aged 39, of L.R.C.P. Edin. who practised at Earlsfield and died in 1902. Applicant is blind, and is training as a masseuse. Prior to the recent death of her mother, who had a pension for life, they managed. The applicant is now dependent on a relative who has to earn her living. Help wanted for tuition fees. Voted £10.—Daughter, aged 68, of M.R.C.S. Eng. who practised at Plymstock and died in 1879. Applicant has recently lost £30 per annum through the death of a friend. Only certain income £11 per year. Lives with sister, who receives an annuity from the Fund. Relieved three times, £35. Voted £12 in 12 instalments.—Daughter, aged 55, of M.R.C.S. Eng. who practised at Manchester and died in 1896. Applicant managed to earn her own living until an attack of nervous debility a few years ago necessitated her giving up her work. Only income a pension from her late employer of 6s. per week. Relieved twice, £24. Voted £12 in 12 instalments.—Daughter, aged 49, of M.D. Glasg. who practised in Derbyshire and died in 1872. Applicant was left totally unprovided for, and has tried to earn a living by taking in paying guests, but owing to the war has not been successful of late. Relieved once, £10. Voted £10 in two instalments.—Widow, aged 61, of L.R.C.P. Edin. who practised at Dumfries and died in 1908. Was left unprovided for with four children, none of whom are able to help. Only income a pension of £12 per annum from another society. Relieved seven times, £68. Voted £12 in 12 instalments.—Widow, aged 58, of M.D. Edin. who practised in Cumberland and died in 1903. Left totally unprovided for, and tries to earn a living by taking in boarders, but owing to her residence being on the East Coast has been unsuccessful since the war. Has four children, all married and unable to help. Relieved 10 times, £112. Voted £12 in 12 instalments.—Daughter, aged 52, of M.R.C.S. Eng. who practised in London and died in 1895. Owing to exceedingly bad health applicant is unable to take permanent employment. Only income £28 per year. Relieved four times, £51. Voted £12 in 12 instalments.—Widow, aged 47, of M.D. Edin. who practised in Glasgow and died in 1912. Applicant was left unprovided for with seven children. The elder ones are now married and unable to help, and the four younger children are at school. Only permanent income £22 from other charities. Tries to supplement this by taking in boarders, but unsuccessfully. Relieved four times, £72. Voted £20 in 12 instalments.—Daughter, aged 65, of M.R.C.S. Eng. who practised in London and died in 1883. Left totally unprovided for, and has worked in various ways to try to support herself, but was unable to provide for her old age. Her income now from a charity and friends totals £28, and she tries to supplement this by poultry-keeping. Relieved three times, £30. Voted £6 in 12 instalments.—Daughter, aged 67, of M.R.C.S. Eng. who practised in North Devon and died in 1903. Was left totally unprovided for, and her health is exceedingly unsatisfactory, which has prevented her from working. Her only income has been a few shillings weekly from friends. Previous help £14. Voted £12 in 12 instalments.—Widow, aged 46, of L.S.A. Lond. who acted as ship's surgeon and died in 1912. Was left with three children, aged 8 to 24. The eldest is unable to assist, and the others are too young to do anything. Applicant is now working as a typist at £1 per week, but finds it insufficient to keep four persons. Relieved four times, £18. Voted £12 in 12 instalments and referred to the Guild.—Widow, aged 66, of Surgeon in the Army Medical Service who died in 1888. Only income a War Office pension. Was operated upon six years ago for cancer, and had breast removed. Has four children, but all married and none able to help. Wants a little help to furnish spare bedroom so that she might take in a paying guest. Relieved once, £16. Voted £5 through the Guild.

Subscriptions may be sent to the honorary treasurer, Dr. Samuel West, 11, Chandos-street, Cavendish-square, London, W.

# New Inventions.

### EXTENSION GLOVE FOR CASES OF MUSCULO-SPIRAL PARALYSIS.

THE glove here illustrated is designed to replace the paralysed extensor muscles, maintaining the extended position of the hand and fingers, and the relaxation of those muscles which is essential to their recovery. A leather armlet above the elbow is connected by an adjustable leather strap to the wrist of a stout leather glove. Inside the glove elastic bands pass from the wrist to the top of each finger. These bands pass through wash-leather loops which maintain them in position, and they are so adjusted in tension as to just maintain the extension of the fingers. The effect of the whole is that when the flexor muscles are relaxed and the hand is at rest the fingers are completely extended and the

wrist is slightly dorsiflexed. On contraction of the flexor muscles the fingers and wrist can be flexed and the hand used in an almost normal manner. An important feature is the increase in power of grasp produced by the extension of the wrist. The glove has great advantages over any form of fixed apparatus, for it allows perfectly free movement of every joint and does not interfere with the balance in walking.

The glove is quite inexpensive, and is made by Messrs. Allen and Hanburys, Limited, 48, Wigmore-street, W.

H. S. SOUTTAR, M.B., M.Ch. Oxon., F.R.C.S. Eng.
Queen Anne-street, W.

THE STANLEY HOSPITAL, LIVERPOOL.—At the annual meeting of supporters of this hospital, held on April 3rd at the Town Hall, the Lord Mayor of Liverpool, who presided, said that the past year had been one of exceptional difficulty. Some 60 beds had been placed at the disposal of the Government for wounded and sick soldiers and sailors, and the appreciation expressed by those treated had been most encouraging and gratifying. To meet the increased expenses in all directions he earnestly appealed for £1500. The number of cases treated in the hospital for the past year was 15,075, including 1078 in-patients, among whom were 323 wounded soldiers.

# THE LANCET.

*LONDON: SATURDAY, APRIL 8, 1916.*


## The Health of Munition Workers.

IT will be remembered that last year a Committee was appointed with the concurrence of the Home Secretary and under the chairmanship of Sir GEORGE NEWMAN, the principal medical officer to the Board of Education, with the following reference:—"To consider and advise on questions of industrial fatigue, hours of labour, and other matters affecting the personal health and physical efficiency of workers in munitions factories and workshops." This Committee has already made a number of valuable reports to the Ministry of Munitions, and the last four Memoranda[1] are of the first practical importance at the present moment. Munitions are being produced at high pressure, and the Memoranda suggest how, without lessening our output of guns, of shells, and of other appliances of war, we may obtain a supply equal to our needs with greater economy of life and health of our fellow-citizens of both sexes. The inquiries of the Committee are not directed to these subjects only in connexion with the war, nor has its advice an application limited to the munition workers for whose benefit it is promulgated as a matter of urgency. Commercial industry will have to be organised with energy, and factories will continue to be worked at full pressure when war is over, if we are to maintain our national position in the world's markets; and the Committee points out that, to the detriment of both health and wealth, the management of our factories has hitherto been less based upon experimental science than has been the case in the business concerns of Germany, the enemy whose industrial organisation and energy are now standing her in such good stead.

In the Memorandum VII. upon industrial fatigue, the Committee expresses the hope that the study of this subject, now forced into notice by immediate need, may have results that will benefit the industries of the country during coming years of peace. One impression produced by this Memorandum is that in these days of stress we are paying dearly now for errors committed in the past, and for recklessness in regard to health permitted in the nineteenth century under conditions of plentiful labour and industrial expansion. The scientific and physiological aspects of fatigue described in this Memorandum might well have been realised in times of peace, and we ought not to have had to wait until the war arrived for the outlining of practical remedies and the regulation of hours of labour, so that the health of the worker might be conserved and the fruits of his toil increased. Certain industrial undertakings, arising out of the war, have special problems of their own—for example, the risks entailed by exposure to lead, tetrachlorethane, nitrous gases, and nitro explosives. In Memorandum VIII. dealing with special industrial diseases, the Committee usefully draws attention to the existing regulations established by the Home Office in 1901 in regard to the risks of contact with lead, but it does not appear that the handling of bullets gives rise to serious lead poisoning. The symptoms of poisoning due to tri-nitro-toluol (T.N.T.) are described and measures for minimising the risk are outlined. Similarly the eczema arising from contact with tetryl, or tetra-nitro-methyl-aniline, is referred to, and here again protective measures are suggested. The Committee refers to the various leaflets and memoranda, dealing in greater detail with industrial diseases and their prevention, and issued by the Factory Department of the Home Office, and in many directions they have relied upon the assistance of Dr. T. M. LEGGE, the senior medical inspector at the Home Office, whose wide experience has been of the greatest value. In Memorandum IX., which discusses ventilation and lighting, the Committee sets out considerations and suggestions which, it hopes, may prove of assistance to those responsible for the ventilating, heating, and lighting of old factories, and for the planning of new factories and workshops. In Memorandum X. it inculcates the importance of two cardinal principles:—that the prevention of disease is better than waiting till it has to be cured; and that treatment to be effective must deal with disease at its beginning, steps being taken to secure recognition of its presence at an early stage.

The urgency of the demand for increased supplies to our armies in the field has been the cause of the evils which have arisen, and it is recognised that injury to the health of munition workers, where it has occurred, has been largely due to their own patriotic zeal. The Committee has rightly laid stress upon the increase or diminution of output as the most direct test with regard to fatigue, and in explaining this has been careful to supply examples from actual experience, which are likely to appeal more directly to many laymen than explanations of the causation of fatigue from the point of view of the physiologist. Excessive fatigue due to overdriving the human machine is thus placed in its true light, not as a hardship which must be endured by the worker for the sake of the cause in which he is sacrificing his comfort or his health, but as an enemy, to him and to the country, which must be guarded against, because it diminishes production and because any loss of health due to it is a useless and wasteful extravagance. Moreover, the Committee recommends that proper management should take account of the output of particular individuals, and explains that where this has been done variations of individual output have been discovered which have been independent of personal willingness and industry. Two good results thus ensue: it has been possible to detect in individual workers superiority of method, obtaining from their example valuable hints for the instruction of others, and

[1] Memorandum VII., Industrial Fatigue and its Causes. Cd. 8213. VIII., Special Industrial Diseases. Cd. 8214. IX., Ventilating and Lighting of Munition Factories and Workshops. Cd. 8215. X., Sickness and Injury. Cd. 8216. Obtainable from the usual official publishers, or through any bookseller.

also to impose upon each the work best suited to his powers, rearranging and assigning the work in such a way as to secure its most effective performance. In matters appertaining to health, the desirability of watching for early signs of breakdown is insisted upon; in this way only can it be dealt with promptly, so that the worker may return with the least possible loss of time. With regard to accidental injury, explicit instruction is given as to both the institution in a factory of a local dressing station for minor injuries and a central dressing station or surgery for the treatment of more serious cases; the actual treatment which should be accorded in the absence of surgical assistance is also mentioned. A leaflet issued by the Home Office is appended here, containing explanations of a practical character as to what should be done and (of equal importance) as to what should not be done by the injured worker and those in his immediate neighbourhood in order to avoid sepsis and the conversion of a slight hurt into a serious one. In the matter of ventilation and lighting, with the cognate topic of heating, the Committee has recognised the fact that the problems to be dealt with must depend largely upon the particular circumstances of each case, and has set out considerations and suggestions in the hope that they may prove of assistance. The essentials of good lighting are summarised and means are proposed to secure its adequacy, with uniformity of illumination, with protection for the eyes of the worker, and with the avoidance of unnecessary shadows upon the work. Fortunately, as the period of daylight is now increasing, and summer draws near, questions of lighting and heating workshops and factories will become for a time easier of solution, but a considerable amount of night-work will still have to be done, and both by day and night bad lighting has as its results headache and other effects of eyestrain, as well as a diminished output. Ventilation, we are inclined to think, is a more difficult problem for the factory manager to deal with than even lighting, although it, too, becomes easier in warm weather than in winter. The Committee insists upon the necessity for a stimulating as well as a clean atmosphere for workers, but the stimulation of moving air is perhaps not unnaturally liable to be resisted by the workers when the breeze is introduced from outside at a temperature many degrees lower than the interior where they are congregated.

May we express the hope that the weighty precepts which the Committee desires to inculcate will win intelligent appreciation beyond the limits of Mr. LLOYD GEORGE'S jurisdiction as Minister of Munitions? If we leave out the passages referring to accidental injuries, there is little in the Memoranda upon which we have commented which might not be applied with equal force where work is being done in offices under various other departments in connexion with the war. A large host of clerks, typists, and other sedentary workers of both sexes is being employed, and has been ever since the war broke out, in operations which require unremitting attention, and for spells which have no parallel for similar occupations in time of peace. For these men and women unduly long hours, lack of weekly and other holidays, excessive night-work, bad lighting, and bad ventilation are no less to be deprecated than for the more laboriously occupied munition worker. And the result must always be the same with all classes of workers—injury to health, temporary or permanent according to circumstances, so far as the individual is concerned, and as far as the public is concerned diminished efficiency, retarded production, and waste of money in paying for that which affords no adequate return.

## The Supply of Medical Men for the Navy and Army.

THE War Office, in a statement which is also an appeal, declares that, in order to maintain the supply of medical officers needed in the military services, it is necessary that all qualified medical men up to 45 years of age should fall in with the Enrolment Scheme of the Central Medical War Committee. The statement of the War Office on the subject is published in full in THE LANCET this week, and has, we are glad to say, also received very wide notice in the lay press, its public issue being dictated by the fact that urgency is as much necessary in the interest of the civil community as it is in that of our armies. It is thus made perfectly clear that in the opinion of the military authorities there is only one way, unless new regulations are made, to obtain a sufficiently large body from which to choose those who should enter upon military service and those who should remain in civilian employment; and this way is a very general enrolment. Nor must it be forgotten that the navy also needs medical officers, and that this need may become acuter. The navy has refrained from making any claims upon the civilian profession recently, but its right to whatever it requires is paramount.

The War Office points out that enrolment, the machinery of which is already being conducted by three representative bodies for England and Wales, for Scotland, and for Ireland respectively, does not imply that the enrolled medical man will be at once called up for service in the Royal Army Medical Corps; this we have stated on several occasions, and we are glad to read the official endorsement. As a matter of fact, the enrolled man may never be called up, and in any case will not be requisitioned until the proper time for his services to be accepted has arrived; and that time will be ascertained by a careful consideration of all the circumstances concerning his practice and the practices of his immediate colleagues, as well as the medical provision for the community which, in the time of peace, he serves. It is in this way that the Enrolment Scheme should lead to those medical men being selected for the services who can best be spared by a particular date and from a particular place, a properly proportioned regard being paid to the needs of the three parties concerned, the fighting organisation, the civil population, and the medical officer. We hope, indeed we expect, that the clear words of the War Office will remove some of the doubts which have been

experienced by the members of the medical profession, both as to the need for additional medical men in the Royal Army Medical Corps and the practicability of the method chosen by the Central Medical War Committee for meeting that need. The Enrolment Scheme, if entered into by a large majority of the constituency concerned, should ensure an equitable distribution of the burden as it affects the medical profession; and in order to avoid the alternatives of haphazard recruitment or arbitrary demand, the War Office has officially decided to rely upon the Central Medical War Committee, and the corresponding Committees in Scotland and Ireland, to meet the shortage in the Royal Army Medical Corps as it occurs. The extent of that shortage is not suggested, in so many words, by either the navy or the army; but it is clear that it must depend upon the course of the war and the rapidity with which additions are made to our fighting formations.

The Central Medical War Committee has been subjected to an extraordinary amount of criticism. Distrust of its policy, its actions, and indeed of its morals, has been widely suggested, and the number of times is very great that questions have been asked in Parliament having as their aim the extraction from the Government of some admission that may be damaging to the status of the Committee. As far as can be ascertained, the Committee has worked steadily for the good alike of the medical profession and the community. We are glad, therefore, to see the Committee and its Scottish and Irish similars described in the War Office statement in the following terms:—

> These Committees include representatives of the Royal Colleges of Physicians and the Royal Colleges of Surgeons, of the Universities and Medical Schools, and of the British Medical Association, and have associated with themselves in their work representatives of the Government Departments mainly concerned. The Committees have an organisation of representative local committees in all parts of the three countries, from which they obtain local information and advice, and they work in daily contact with the various Government Departments concerned. Furthermore, for the purpose of considering and advising, through the Central Committee, on cases in England and Wales having such special features as exist, for instance, in regard to the staffs of the metropolitan hospitals, a Committee of Reference has, with the approval of the War Office, been now established by the Royal College of Physicians of London and the Royal College of Surgeons of England, acting jointly.

May we hope now that all medical men will work to assist the Central Medical War Committee in promoting the Enrolment Scheme and in finding the fittest civilian medical men to serve in the navy and army? The Enrolment Scheme becomes an essentially fair one, seeing that the Central Medical War Committee has decided to call up no practitioners under it unless and until 75 per cent. of those medical men, who on Jan. 5th, 1916, were of military age, have enrolled or received a commission.

THE LATE MR. W. B. RICHARDSON.—William B. Richardson, late senior surgeon to the Victoria Hospital, Blackpool, died suddenly on March 30th, in his sixty-ninth year. He became a Member of the Royal College of Surgeons of England in 1875, and had been in practice for 40 years in Blackpool. He was one of the founders of the Victoria Hospital and generously supported that institution, of which he was honorary surgeon for 20 years.

# Annotations.

"Ne quid nimis."

## THE BUDGET AND THE MEDICAL PROFESSION.

THE Fourth War Budget is of the colossal magnitude which was to be expected in view of all the circumstances, and in its main features it is so clear that we may take it for granted that our readers are already acquainted with their main purport. It is doubtful if it was generally expected that the income-tax would be raised in quite the manner employed or to such high figures; but the announcement that there is to be no increase in this respect on naval and military pay will be a welcome relief to the large numbers of our profession who are doing their duty with the forces. The rest of us will bear the graduated increases, which range from 5*d.* in the £ on incomes above £500 and under £1000 to 11*d.* on incomes under £2000, with that cheerfulness with which medical men usually shoulder their share of the responsibilities of citizenship. The increases on incomes between £2000 and £2500, which are more onerous, do not affect a large proportion of our unwealthy class. Those who are so fortunate as to possess unearned incomes will have to pay an addition of 6*d.* in the £ on incomes between £500 and £1000, and of 1*s.* in the £ on incomes above this sum and below £2000. The new proposals for taxation introduce some features of particular importance to the medical profession. The raising of the licence duty on motor-cars will affect the practitioner in proportion to the horse-power of his car. It will fall more heavily on the owners of American cars, and especially on those who have the "Ford" car, the duty on which is raised from £6 6*s.* to £18 18*s.* This represents a serious difference in annual outlay to a man whose practice is not a large one, and indeed the doctor is being hard hit at the present time in connexion with his motor-car, which he cannot put down as it has become indispensable to him in the working not only of his own practice but quite possibly of the practice of an absent colleague. The precarious supply of his petrol is a source of perpetual worry, he has to pay an exorbitant price for it when he does get it, and now he has to pay double or treble the licence duty. We feel that before the Budget proposals pass into law an effort might fairly be made to give the medical man some relief.

## THE SUPPLY OF PETROL TO MEDICAL MEN.

THE form issued to medical men at the end of last week by the National Health Insurance Commission, asking them to supply details concerning their use of motor vehicles and their consumption of petrol, is a welcome sign that our authorities are alive to the urgent necessity for securing to practitioners an adequate supply of motor spirit. If some such course is not taken it may become impossible for some medical men to carry out their professional duties with that expedition which their calling and their attenuated numbers demand. For it must be remembered that several thousands of our colleagues are away from their practices and that the shortage of medical men with the services is still unsatisfied. Complaints have reached us already of the serious position in which some medical men find themselves in consequence of their inability to get petrol, especially in

remote country places. That there would be a sufficiency of spirit for the Government purposes and yet leave an ample supply to meet the real necessities of the public appears to be generally agreed if "pleasure" motoring is put down; the use of petrol, for instance, in conveying the votaries of horse-racing to and from their places of meeting is simply a scandalous waste—that such a thing should be permitted reduces our allies to complete bewilderment and seems to more thoughtful citizens to render the Zeppelin raids, with their attendant horrors, a tonic to be taken gratefully. Given an adequate supply of petrol, the great difficulties to be overcome are, of course, those of proper transport and distribution. There is little doubt that a restriction will soon be put upon the present indiscriminate use of the spirit, but the medical man, who is generally allowed to be among those who would have first claim upon the supply, will unfairly suffer under such a system. A regularised supply will not avail the practitioner in the remote and smaller country villages unless some means are evolved by which he can get without fail that amount of petrol which will enable him to carry on his work. There would appear to be only one way in which the regular supply of petrol to the medical profession can be secured, and that is by the Government taking over the whole of the petrol supply of this country, and using the existing organisations of the two or three great supply companies for its distribution. Otherwise it seems clear to us that many medical practitioners in the country may have infinite anxiety and may be forced to curtail their range of work in a disastrous manner. The supply companies know the requirements of the districts, including every little village and hamlet; and there would be no need for the work of the medical man to be crippled if their services were properly acquired. The question has become acute in some places, and no doubt much more acute than it need have been at the present time owing to the action of many car owners who, having bought largely in view of a threatened famine, hold up not merely the spirit itself, but, what is of even more importance, the tins in which the spirit is stored. Another point to which the authorities should give their attention is the exorbitant price which is now being charged for the commodity. Is this governed by ordinary commercial considerations, or by the demands of the oil trusts? To the medical man the successive increases in prices during the past few months are a very serious charge on his income.

## THE DISINFECTION OF SEPTIC JOINTS.

Dr. F. J. Cotton has contributed to the *Boston Medical and Surgical Journal* an important paper on a subject of considerable interest at the present time—the disinfection of septic joints. He strongly condemns the drainage of joints as responsible for the disastrous results obtained in the past in cases of suppuration. Either the attempt to save the joint should be regarded as hopeless, in which case the joint should be laid wide open (not drained), or all efforts should be made to preserve the function of the joint. About 10 years ago, when engaged in washing out gonococcic joints, Dr. Cottor found, both in the small minority which gave a culture and the majority which did not, that the results were better if the joint was sewed up tightly than if it were left to drain through loose suturing, while wick or tube drainage proved, as has since been recognised, disastrous to function. He then treated septic joints (principally staphylococcic with a few streptococcic) by sewing up the capsule tight after irrigation for 15 minutes with a full stream of 1 in 15,000 corrosive sublimate and flushing out the excess with saline solution. He effected water-tight closure of the capsule by mattress and single sutures in such a way as to leave the synovial membrane cut-edge to cut-edge as accurately as possible. Usually the membrane is so swollen as to make this possible. The external wound is left wide open or nearly so, for complete disinfection of the external soft tissues is not practicable. After operation effusion into the joint may or may not occur. If it does, it disappears in one to three days and is not accompanied by pyrexia or much discomfort. With few exceptions, Dr. Cotton has not found traction for the separation of joint surfaces necessary. There was neither pain nor spasm sufficient to indicate it. In about two dozen cases treated by this method there were only two failures. In a case of streptococcic infection of the knee in a man, due to a punctured wound, recurrence took place. The joint was then laid wide open. Later, after vaccine treatment, the granulations were cleaned out from nearly intact cartilage and the divided ligaments were sutured. In the end the patient regained a good leg with 45 to 50 degrees of motion. In the other case a boy had an epiphyseal staphylococcic infection of the knee. The joint was cleaned out and sutured. Later the joint broke down and ankylosis resulted. The following shows the usual result. A sturdy girl aged 10 years was seen in consultation. About two weeks previously she hurt her knee in jumping down a cellar. The knee was greatly distended, tender and hot, but not red. The temperature was 102·5° F. A juxta-epiphyseal infection of the knee was diagnosed. The joint was opened on the inner side and found full of thick creamy pus. The irrigation described above was performed and the joint closed. Through an incision on the outer side a large popliteal abscess was opened and drained. After eight days there was no fluid in the joint, the tenderness was less, and the wound had nearly healed. Though a sequestrum formed in connexion with the epiphyseal line of the femur and a sinus at this spot persisted for a year, the knee-joint so completely recovered that it could be distinguished from the other only by the scars.

## AMBARD'S COEFFICIENT.

THE index of urea excretion known as Ambard's coefficient or constant and enunciated by him in 1911 is perhaps less appreciated in this country than on the continent and in America. The formula devised by Ambard may be expressed as— $\frac{Ur}{\sqrt{\frac{D}{W}}\sqrt{C}} = K$, where Ur represents grammes of urea per litre of blood, D the grammes of urea excreted in 24 hours, W the weight of the patient in kilogrammes, C the grammes of urea per litre of urine, and K the coefficient or index of urea excretion. Dr. V. Grossi has lately made some observations on the clinical application of this coefficient which are published in *Il Policlinico* (Surgical Section, Feb. 15th, 1916), the cases consisting of 13 renal tubercle, 9 hæmatogenous infections, 8 calculous pyelitis, 3 renal growths, and 8 surgical affections of the lower urinary tracts. The conclusions arrived at by Dr. Grossi are that Ambard's coefficient is a valuable method for ascertaining the efficiency of the renal function, and is

capable of confirming in its extreme limits a fatal prognosis or of advocating caution as to operative intervention. It is superior to colorimetric methods in cases where ureteric catheterisation is impossible. The interpretation of the coefficient must be made in each case based on its various factors, and must not be taken as an absolute number. The significance and pathology of uræmia and of Ambard's coefficient are far from being clear; in the present-day state of our knowledge they must be regarded as ordinary signs which merit great importance and extended application similar to the presence of albumin in the urine.

## THE CORTICAL REPRESENTATION OF MACULAR AND PANORAMIC VISION.

THE last number of *Brain* (December, 1915) contains a valuable contribution to the study of the complexities of the cortical representation of vision, in which Dr. Byrom Bramwell, of Edinburgh, Professor J. Shaw Bolton, of Leeds, and Dr. William Robinson, of the West Riding Asylum, Wakefield, have collaborated. The case is that of a man who was seen originally by Dr. Bramwell as long ago as February, 1886, when the patient was 45 years old. His complaint was loss of vision, which was said to have come on suddenly with an attack of what appeared to be uræmic convulsions in June, 1884. On examination the loss was found to consist in complete abolition of peripheral vision, with very marked reduction of macular vision. Dr. Bramwell saw the patient at regular intervals up to his death from pneumonia on Oct. 21st, 1910. During 24 years the condition remained practically speaking unchanged; macular vision improved slightly, while peripheral vision remained completely obliterated. Throughout the whole course of the case there was no motor paralysis, loss of sensibility, or any form of aphasia. Some five years before the patient's death his ocular condition was independently examined by Dr. A. H. H. Sinclair, of Edinburgh, who reported extreme contraction of the visual fields, the fixation point being probably encroached upon on the left side in both eyes: R. V. = 6/36 uncertainly; L. V. = 6/36 and 6/24 partly. The pupils were equal and reacted to light. Both optic discs had a somewhat leaden-grey atrophic appearance, with extensive shallow cupping. The brain lesions were eventually found to consist in extensive destruction of the white matter and part of the cortex of the left occipital lobe and also of the right occipital lobe, apparently the result of old embolic softenings. The pathological investigation was exhaustively worked out by Professor Shaw Bolton and Dr. Robinson. On the right side the lesion, which was mainly on the outer aspect of the lobe, reached the occipital pole and nearly to the outer extremity of the calcarine fissure; nowhere else in either hemisphere did the lesion come into even the approximate neighbourhood of the cortical visuo-sensory area. The cortical extent of the latter was delimited on both sides by laborious histological methods, and ascertained to be more or less strictly normal in distribution—i.e., embracing the calcarine fissure and its immediate vicinity. Pathologically speaking, no defect was discoverable in the cortex of the calcarine fissure and that quite adjacent to it, whereas the cortex of the whole peripheral portion of the visuo-sensory area was the seat of a simple atrophy involving mainly the three outer layers of the grey matter. The surrounding visuo-psychic cortex exhibited little or no abnormality. The conclusions drawn from this case are that the calcarine core of the pear-shaped visuo-sensory area serves as an anatomical basis for macular or central as distinct from non-macular, peripheral, or panoramic vision, while the latter is represented in the surrounding and remaining visuo-sensory cortex. It is probable that human macular vision is an evolution dependent on the development of the faculty of using corresponding parts of the retinæ simultaneously, and that it is superposed on the neuronic apparatus for panoramic vision, the two types shading into one another. The writers of this paper are to be congratulated on the patience with which they have followed up and investigated so striking a case.

## NITROGEN: ITS VIRTUES AND ITS VICES.

PERSONS who talk of the importance of chemistry in this war are usually talking of one thing only, though they may not know it—and that thing is nitrogen. The chief chemistry of the war is practically centred on nitrogen. Recognising this fact, it is strange to think that we live by breathing an atmosphere containing 80 per cent. of this element which in certain combinations is dealing out death on an appalling scale in all the fields of action. There are practically no useful explosives employed in which the action of nitrogen is not concerned. Without its aid the great ships at sea could not be sunk, or innocent victims on land killed, or property destroyed by the aeroplane and dirigible; while it serves to mow down whole columns of men in the field, for rifles, howitzers, machine-guns, and grenades are all dependent upon, and made terribly deadly by, the offices of nitrogen. We every day pass on to our lungs something like 450 gallons of nitrogen per 24 hours, which would be enough to make 30 pounds of tri-nitro-toluol, or 40 pounds of gun-cotton. In our early training in the elements of chemistry we were wont to regard nitrogen as a singularly uninteresting gas on account of its negative behaviour. It did not burn like hydrogen, it did not support combustion like oxygen, and, in short, its presence was generally assumed because of its inactivity and because it did not directly respond to any test. And yet this element is the greatest of all as a munition power; it is hardly an exaggeration to say that applied nitrogen is going to be a factor in deciding the issue of the war. It is remarkable, also, that this element forms the central figure in the protein group or tissue-repairing material of our foods. To say that without protein we die, practically means that without nitrogen we die. The gas without positive tests is as necessary in one form for our support as in other forms it is ready to destroy us. Nitrogen's power depends in the first place on the fact that it carries in oxygen to compounds which are thus rendered explosive, turning all the elements into a huge volume of gas, itself being set free. The very inertness of nitrogen, or its objection to affinity, means that on the least provocation it will easily release its partner oxygen, handing this over to the combustion of other elements present, with the formation of volumes of gases, the nitrogen returning to what is apparently its congenial condition, the free state. As a fertiliser in the soil nitrogen acts as a stimulant and supplies the necessary nitrogen to the plant. In other words, it is a plant food. Thus the remarkable thing about nitrogen above all other elements is its power to destroy life or to sustain it according to the associates with which it is in company. With

certain accomplices it forms death-dealing explosives, with others it become a nutritive material. It is the essentially romantic element, devil or god, according to its associations.

## THE TREATMENT OF LEPROSY BY CHAULMOOGRA OIL.

WE have on a previous occasion discussed in these columns[1] the treatment of leprosy by chaulmoogra oil, a remedy which is one of the few to retain a reputation after an extended trial in what is regarded by many writers as a hopeless disease. In a recently published special bulletin of the United States Public Health Service[2] entitled "Studies upon Leprosy," Dr. George W. McCoy, director of the U.S. Leprosy Investigation Station, Hawaii, and Dr. Harry T. Hollmann contribute an article giving a summary of the state of our present knowledge of the treatment of leprosy by chaulmoogra oil. These observers, in view of the interest which has been displayed of late on the subject, were led to review the current literature and to place on record their results with this remedy in the Hawaiian Islands. Most of the writers on the employment of this oil in the treatment of leprosy, including, among others, Manson, Scheube, Castellani and Chalmers, Morrow, Hutchinson, Sandes, Ashburton Thompson, and Dyer, express opinions more or less favourable concerning it. The theory of its action seems to be that it increases the number of leucocytes, and that it also increases the bactericidal properties of the blood. Some of its derivatives have been employed, notably the gynocardate of magnesium, which was used many years ago by Dr. Phineas Abraham. In THE LANCET of Feb. 5th Sir Leonard Rogers published a Preliminary Note on the Use of Gynocardates Orally and Hypodermically in Leprosy, in which he stated that he had obtained improvement both in anæsthetic and in tubercular cases more rapidly under the influence of hypodermic injections of sodium and potassium gynocardates than under any other treatment he had tried, including nastin, as also chaulmoogra oil and gynocardic acid by the mouth. He therefore urged others to give this method a careful trial. Referring to the pain produced by the hypodermic injections, he attributed this to palmitic acid present as an impurity, but we have been assured by Mr. W. H. Martindale that palmitic acid is one of the natural constituents of chaulmoogra oil, so that it cannot be regarded as an impurity, though different samples may vary in the amount of this acid that they contain. Mr. Martindale, while recognising Sir Leonard Rogers's high authority, doubts whether the presence of palmitate is the cause of pain complained of. Mr. Martindale has divided the mixture of acids obtained from genuine chaulmoogra oil into two fractions which he has converted into the corresponding soda salts termed respectively sodium chaulmoograte "A" and sodium chaulmoograte "C." The "A" salt contains true chaulmoogric acid plus palmitic acid and other acids of high melting points, while the "C" salt contains the acids of low melting points. The "A" represents from 50 to 75 per cent. of the total "chaulmoogric acid" of commerce, the "C" constitutes the rest. This "A" salt is relatively insoluble in water in comparison with the "C" salt, which is extremely soluble. (Compare the solubilities of curd soap containing stearate with pure sodium oleate.) The solubility is, of course, an important factor from the hypodermic injection point of view. Mr. Martindale adds that to break up the "A" salt and free it from palmitate is possible though difficult, so as to test if the therapeutic activity of chaulmoogra oil is really due to true chaulmoogric acid, palmitic acid being excluded, and he has sent out samples of each of these substances to Sir Leonard Rogers. Dr. McCoy and Dr. Hollmann express the opinion, however, that none of the derivatives offer any advantages over the oil itself, which can be administered in several ways, either by the mouth or by hypodermic injection alone, or in conjunction with other substances, such as guaiacol, camphor, or resorcin. Sometimes the oil is prepared for use by washing with alcohol, or it may be sterilised by heat, before being injected hypodermically. When given by the mouth it may cause nausea or give rise to other signs of gastric irritation. The hypodermic injections have at times caused complications such as abscess, nervous manifestations, heart failure, or sudden embarrassment of the respiration, so that the remedy requires to be administered, at first at least, with care and caution. Dr. Victor Heiser, Director of Public Health in the Philippine Islands, has used the hypodermic injections, and in a report published in October, 1914, on 9 cases treated by this method, in whom the treatment was continued long enough to give a fair trial, he stated that 5 of the patients apparently made a recovery from the clinical point of view; 3 showed marked, and 1 slight, evidence of improvement. Dr. McCoy and Dr. Hollmann used chaulmoogra oil at the Molokai leper settlement, Hawaii, in many cases, administering it sometimes in one way and sometimes in another, the majority taking it by the mouth in gelatine capsules. Few of the patients, however, took this remedy alone, for there is always a temptation to give "anything and everything that might possibly be of benefit to the patient." Out of 42 cases thus treated 16 received hypodermic injections for periods varying from 10 to 17 months, with the result that 10 were improved, 4 remained *in statu quo*, and 2 got worse. The remaining 26 patients had not continued the oil long enough to enable a proper judgment to be passed upon its effects. It may be added that in all these cases carbon dioxide snow was applied locally to the leprous sores. The personal experiences of Dr. McCoy and Dr. Hollmann lead them to conclude that chaulmoogra oil is helpful to many, perhaps to the majority, of cases of leprosy. The hypodermic method of administration, while not free from disagreeable complications at times, seems to have given good results, and therefore a further and more extended trial is warranted. They are sure, however, that the use of chaulmoogra oil as at present practised "is not the solution of the problem of the therapeutics of leprosy."

[1] Vide THE LANCET, Sept. 27th, 1913, p. 946.
[2] Public Health Bulletin No. 75, January, 1916, Studies upon Leprosy, Washington Government Printing Office.

## SPIROCHÆTAL STOMATITIS.

THE observations of Vincent in 1898 first drew general attention to the form of faucial inflammation with formation of false membrane which is associated with the presence of spirilla or spirochætes and of fusiform bacteria, and the name Vincent's angina is now well recognised as applied to this condition,[1] which had previously been confounded with other membranous affections of the throat. The seat of this spirochætal infection,

[1] THE LANCET, 1905, i., 1261.

however, is not confined to the tonsils and their neighbourhood, but the mouth may be the part attacked, the affection then taking the form of an ulcero-membranous stomatitis and gingivitis. In conditions of lessened resistance, due to overcrowding or other depressing circumstances, the disease may appear in epidemic form, and the importance of this infection among troops is shown in a paper by Captain Frederick B. Bowman, C.A.M.C., which is published in the Proceedings of the Medical Section of the Royal Society of Medicine for March. In the cases which form the subject of this report, embracing both officers and men, constitutional disturbance was well marked, and great depression was a characteristic feature. Ulceration occurred on the tonsils, gums, tongue, and mucous surfaces of the cheeks, and the sublingual and parotid glands were affected. The breath was peculiarly foul, and the patients complained of an offensive taste. The gums became spongy and retracted and bled easily, and the teeth in some instances became loose and tender on being tapped. The temperature varied between normal and 102° F. The infection can be conveyed by dental instruments and also probably by eating and drinking utensils. The causal organisms are readily recognisable in smears stained by methylene blue or Giemsa's stain, and can be cultivated anaerobically in peptone broth along with a little ascitic fluid and a fragment of sterile tissue (Macleod's method). An effective treatment for this condition consists in swabbing the ulcers with a mixture consisting of half an ounce of wine of ipecacuanha, one drachm of glycerine, and three drachms of Fowler's solution, and in cases in which the gums are affected this solution should be carefully applied to all pockets around the teeth. The affection must be distinguished from diphtheria, syphilis, and mercurial stomatitis, as well as from simple pyorrhœa alveolaris. In the form which affects the gums the infection is very obstinate, and owing to the depression produced is of considerable importance from a military point of view as producing prolonged incapacity for duty.

## EXPERIMENTAL OSSEOUS SPOROTRICHOSIS.

WE have received from Dr. D'Agata, of the Royal Institute of Clinical Surgery at Florence, a résumé of a paper published by him on this subject. In 1912 he communicated to the Italian Surgical Society a case of primary osseous sporotrichosis of the upper jaw in which the sporotrichium Beurmanni was isolated. From this strain he instituted a series of experiments on rats and white mice, inoculating into the peritoneal cavity and subcutaneous tissue over the bones of the hind limbs a broth culture. Some of the animals died spontaneously, others were killed at different periods from a few days to three months after the injection. In the majority of the cases, from 20 to 40 days after the peritoneal injection, he found the parietal and visceral peritoneum covered with small greyish-white smooth nodules varying in size from a pin's head to a large shot. Histologically they showed three zones, corresponding to the ecthymatiform, the tuberculoid and the syphiloid of French authors. In 10 out of 15 mice thus injected there were osseous foci of sporotrichosis in various stages of evolution in the cartilages, and especially in the epiphyseal regions; there were also cases which showed osteitis of the hypertrophic variety. One of the experiments was particularly noteworthy: that of a mouse injected intraperitoneally and killed after 28 days. In this animal there were only a few lesions in the parietal peritoneum, while in the left tibia there were foci of diffuse osteomyelitis with intra-osseous abscess, and in the neighbourhood of the right tibio-tarsal joint a large serous cyst with a sporotrichositic nodule implanted in the wall on one side. Subcutaneous injections near the tibio-femoral joint almost invariably caused after 20–30 days sporotrichotic inflammatory foci in the peri-articular ligaments, giving rise to local suppuration which frequently discharged externally. In some animals subcutaneous injection produced gummatous lesions at the site of inoculation. Smears from the centre of these showed oval bodies such as have been described as representing the parasitic form assumed by the sporotrichium Beurmanni in human lesions and in those produced experimentally in animals.

## DIFFERENT NAMES FOR IDENTICAL SUBSTANCES.

WE have on several occasions referred to the difficulties that may and do arise from the practice of bestowing different names upon identical substances, the position occurring more often in practical therapeutics in connexion with the synthetic products. When a single synthetic product earns more than one name a real trouble to the medical profession is introduced, and we may fairly call upon the great pharmaceutical chemists and scientific drug-houses to assist us by refusing to perpetuate this trouble, an example of which has been brought to our attention this week. The substance p-toluene-sodium-sulphochloramide was suggested as a wound antiseptic by Dr. H. D. Dakin, working in conjunction with Professor J. B. Cohen. This substance has already met with considerable success. The theoretical basis of the work, full details of the preparation of the substance, and the early practical results of its use have been already published.[1] It is said that the name "chloramine" suggested by the scientific workers responsible for its introduction, has already been appropriated, and the new name "tolamine" has been substituted by Messrs. Burroughs and Wellcome, who have registered tolamine as a trade-name for chloramine-T. We feel that it is necessary to point out that anyone ordering the substance as "tolamine" will be using the proprietary name of a particular firm and not the name preferred by the authors of the substance. The designation of the substance as chloramine-T, as suggested by its originators, should, in our opinion, be generally adopted, as the use of different names for identical substances is a serious source of trouble to medical men.

Mr. Charles Yelverton Pearson, M.D., F.R.C.S., has been appointed one of H.M. honorary surgeons in Ireland in the room of the late Sir Charles Bent Ball, M.D.

Mr. S. H. Renshaw has promised £2000 to Bury Infirmary to endow two beds—one in memory of his wife, and one in memory of his son who was killed in action at the Dardanelles.

[1] Brit. Med. Jour., Jan. 29th, 1916.

# FOOD ECONOMICS IN RELATION TO THE WAR.

BY HARRY CAMPBELL, M.D. LOND., F.R.C.P. LOND.,
PHYSICIAN TO THE WEST END HOSPITAL, LONDON.

## III.[1]

### *The Limitation of the Quantity of Food to a Sufficiency.*

FOOD not only occupies the unique position among the different forms of wealth of being the only one which is essential to life: it has the further characteristic (in common with a few other commodities, such as alcohol, tobacco, coal, and petrol) that its use involves its immediate destruction. The clothes we wear may last us months, even years, our dwellings may outlast centuries, but the food we eat is rapidly consumed within the body. It will thus be seen that any consumption of food beyond what is actually needful constitutes a net waste of the most important form of wealth, and this at the time when the strictest economy is called for. Those who delight in ethical subtleties might take as an interesting subject for discussion the question whether the thief or the glutton is the greater sinner. It would be open to anyone to argue that robbery is a less deadly sin than gluttony, seeing that the one consists in a mere transference of wealth, while the other involves a useless and even harmful destruction of it. Many people eat more than they require; not a few as much as would suffice for two, nay, even three persons. A saving of wealth running into millions could be effected if only those who exceed were to reduce their rations to the actual needs of the body. Excessive eating not only constitutes a waste of national wealth, it also injures the health. It is a trite but true saying that more people die from over-eating than from over-drinking. The transgressor in diet, moreover, is less efficient as a citizen, and at the present time we all need to be at our very best, mentally and physically. Yet I see little attempt in clubs and restaurants to economise in food. I recently estimated that the regulation supply of food at a prominent London club was about twice the quantity actually necessary, and a large proportion of the habitués gave evidence of the havoc which prolonged over-eating had wrought in their tissues. I lately heard a visitor to a country hotel remark to the landlord upon the abundance of the fare he provided. "Yes," was the proud rejoinder, "this is a house of plenty." At the fashionable West End restaurants food and drink are as lavishly consumed at the present time of crisis as in the piping times of peace. I think it possible that food is supplied too generously in some of our public institutions. At a large London workhouse which I visited some years ago it seemed to me that the supply of bread was more than was necessary, certainly in the case of some of the inmates.

I am convinced that the quantity of food required to maintain in health a person not engaged in strenuous muscular exercise is much less than is generally supposed. Young adults need more food than older people—our food requirements diminish with advancing years—yet it is surprising how small an amount of food even young people leading active lives can thrive on. Thus the diet of a young woman weighing 10½ st., the embodiment of healthy womanhood, whose daily routine is one long round of activity—bustling about the house, riding, driving, walking, &c., is somewhat as follows: Breakfast: A little bacon or fish, or an egg, with a couple of slices of bread-and-butter. Midday dinner: Equivalent to what a town-dweller would regard as a moderate lunch. Tea: A little bread-and-butter. Before going to bed: An apple or some other fruit. On this diet she keeps her weight, looks a picture of radiant health, never feels tired or unpleasantly hungry, and can always forego a meal without discomfort. The following is the diet of a London postman, aged 26, who walks about 15 miles in the day, and on some beats has to mount some 5000 steps daily (he carries a weight not exceeding 30 lb.): 5 A.M., a piece of toast and a cup of tea; 9 A.M., one rasher of bacon, four moderate slices of bread-and-butter, two cups of tea; 2 P.M., chop or cut off the joint, four potatoes, and green vegetables; 6 P.M., a bloater (or some other fish), four slices of bread-and-butter, one cup of tea. I could furnish many similar instances. Cases of this kind—and they are quite common—show how little food is needed in perfect health, even in the heyday of youth, and when a considerable amount of muscular work is being performed. They probably indicate the possession of a well-nigh ideal digestion. Others apparently healthy no doubt require a somewhat more generous diet.

The two chief factors which make for excessive eating are the appetising nature of the food and the softness of the vegetable (especially the farinaceous) portion of it. The object of the cook is to make her dishes as tasty as possible, and so to arrange their order that the appetite shall not flag throughout the meal. As to the second factor, it is obvious that soft farinaceous foods, such as porridge and milk puddings, which rapidly find their way into the stomach, are more likely to be taken in excess than firmer food, such as crusty bread, which calls for thorough mastication. The more completely farinaceous food is masticated the smaller is the quantity that will be needed to satisfy the appetite.

Another cause of excessive eating depends upon the principle that "appetite increases by what it feeds on." The more one accustomes oneself to eat largely the more clamant does the appetite become. Excessive eating, indeed, tends to beget an actual craving for food not unlike the morbid craving for stimulants. When the meal-time comes round, or even before, there is felt a sinking or other uncomfortable sensation at the pit of the stomach, or perhaps a feeling of lassitude. These feelings being relieved by food, it is erroneously concluded that they indicate the need for a restoking of the vital engine. That this view is entirely wrong is shown by the fact that many a healthy person, expending a good deal of muscular energy and consuming but a moderate quantity of food, can forego a meal without inconvenience. Even more significant is the fact that the habitual over-eater generally feels brighter and more vigorous after enforced abstinence, such as may be necessitated, e.g., by a bilious headache or an attack of gout. The machine is found to work better when the stoking ceases. The fact is, the unpleasant feelings referred to are not due to the lack of nutriment and do not indicate the need for more. The "sinking" results from the absence of the wanted mechanical stimulus afforded by a bulky meal; the lassitude is due to a poisoned state of the blood brought about by

[1] Nos. I. and II. were published in THE LANCET of March 25th (p. 685) and April 1st (p. 742) respectively.

chronic over-eating, and is removed temporarily by the absorption of the more diffusible, stimulating elements of the food. In this way the effects of the blood poisoning are for the time masked.

The over-eater, like the alcoholic inebriate, rarely realises that he is indulging in an injurious excess. In deciding whether too much food is being taken or not, the body weight affords useful help. If a person's weight is not above the normal the probability is that he is not eating too much, but if he is decidedly stout he very probably is over-eating. This test is not, indeed, infallible; we occasionally meet with thin people who eat abundantly and stout people who are moderate eaters. What is so frequently forgotten is the fact that the amount of food taken should be proportioned to the amount of muscular energy expended. If a person takes little exercise he requires proportionately less food, just as it requires less petrol to drive a car five miles than fifty. When a person who takes little exercise gets fat his fatness should not be put down to the lack of exercise, but rather to the fact that his supply of food is in excess of the amount of muscular energy expended. The London policeman probably consumes as much as the London postman, although he does not expend more than a quarter of the muscular energy expended by the latter. It is clear, therefore, that he eats more than is necessary—a conclusion which is not infrequently borne out by the amplitude of his proportions. It is as rare to meet a thin policeman past 30 in our towns as it is to see a stout postman anywhere. Stout people often resent the charge that they eat too much, and insist that they are very moderate eaters. Investigation generally shows otherwise, but whether they eat much or little the fact remains that in the vast majority of cases they eat more than they require.

All those who on reflection have reason to suspect that they may be eating superabundantly should, alike in their own and nation's interest, cautiously begin at once to cut down their rations. In this way they can improve their health, render themselves more efficient citizens, and save the wealth of their country. It is not suggested that a large reduction should be made suddenly. Rather should an attempt be made to accustom the body gradually to do with less and less food. To this end the food should be plain, not too appetising, and well masticated. Unfortunately, the British people are the most inefficient masticators in the world. I will now endeavour to explain how this bad habit has arisen, and to indicate some of the evils which result from it.

*Mastication.*—Efficient mastication among other advantages makes for economy in food, inasmuch as it promotes normal digestion and in this way reduces the amount of food needful to sustain the body. It is not generally known that it is essentially the vegetable portion of our food which demands mastication. The carnivora do not masticate their food, as anyone who has observed a dog bolt a piece of meat can testify; their teeth interlock and do not admit of any lateral grinding action. On the other hand, all the vegetable-feeding mammals are laborious masticators. This is because vegetable food consists of a cellulose framework more or less dense, which it is necessary to break up, so as to liberate the contained nutrient particles and allow them to come under the action of the digestive juices. That our ape-ancesters subjected their food to prolonged mastication is evident from a study o' the teeth of their near relatives, the larger manlike apes (gorilla, chimpanzee, and ourang). I find that even the milk teeth of these animals are greatly worn down. Before man learnt to prepare his vegetable food artificially by maceration, grinding, and cooking, he had to subject most of it to a prolonged natural milling with his teeth. Our teeth have been to a great extent relieved of this laborious work by the miller and the cook. The saving of the work of mastication thus effected has certain manifest advantages, but these are largely discounted if the farinaceous food is rendered so soft that it is swallowed without being subjected to any but the merest pretence at mastication, for then not only is it not properly mixed with the saliva, but the teeth and salivary glands are cheated of their normal work. Now, unfortunately, in this country we consume all, or nearly all, our vegetable food in soft, pappy, pultaceous and spongy forms, with the result that we have come to be a nation of veritable food-suckers, with atrocious teeth, misshapen jaws, and none too good digestions. Our sole vegetable foods which invite mastication are crusty bread, dry toast, hard biscuits, salads, nuts, and apples. Our staple vegetable food, bread, is eaten in a spongy form. The loaves are shaped so as to give a minimum of surface for crust, and are lightly baked so that the crust shall be as thin as possible. In the "A. B. C." shops it is the custom when cutting the rectangular loaves into slices to put aside the end pieces, as the customers refuse to eat them. I am told by a Scotch baker that the most crusty loaves—those which rest on the floor and against the sides of the oven—fetch a lower price than the others, so rooted is the objection of the Scotch people to crusty bread.

Let us now consider the foods which form the bulk of our national vegetable diet. They are: soft spongy bread, bread-and-milk, cooked vegetables, puddings (suet, batter, "Yorkshire," plum, cabinet, milk, &c.), porridge, cakes (multitudinous), buns, scones, muffins, crumpets, tea-cakes, and fancy cakes galore. To set forth in detail the many evils which result from this pernicious system of diet would require several articles. The one I desire to emphasise just now is that it causes an excess of farinaceous food to be consumed. The more thoroughly a farinaceous food, such as bread, is chewed, the more intimately will it be mixed with the saliva, and the more efficiently is it likely to be digested; and it goes without saying that when food is well digested less of it will be required than when it is not. A piece of crusty bread, thoroughly masticated, will go a longer way to satisfy the appetite and the nutritive requirements of the system than an equivalent of pudding hastily swallowed.

The best way to secure adequate mastication is to choose foods which invite, or even compel, mastication. It is chiefly in regard to the cereal foods—wheaten flour, oatmeal, and rice—that reform is most needed. From the point of view of mastication oatmeal biscuits are preferable to oatmeal porridge, but the latter is so popular and valuable a food that it may be permitted with the proviso that it be subjected to some sort of chewing, and not allowed to flop like some huge poultice into the stomach. Wheaten flour—our staple vegetable food—should be employed for little else than bread, suet pudding (plain suet pudding, fruit pudding, meat pudding), plain biscuits, and home-made cake. Other puddings and the multitudinous varieties of cakes known to the pastry-cooks should be banned;

they have no special virtue and they can well be dispensed with. When a patient is knocked off his puddings or "sweets" by his doctor he often asks in a concerned or even injured tone what he can eat instead? The answer is that bread-and-butter (i.e., flour and fat) is as nutritious as any ordinary pudding and more wholesome than most. It is a good food because it is nutritive, simple, and (if the bread is crusty) compels mastication. It is, of course, chiefly in the form of bread that wheaten flour should be consumed. The loaves should be shaped so as to give a maximum surface for crust (spindle-shaped, or cylindrical-shaped) and well baked, so as to give a thick but not too hard or brittle crust. Unfortunately, many people are prevented by bad teeth from eating crusts.

*Defective teeth.*—Here I am led to say a few words about the deplorable condition of the teeth of our countrymen, the more so as the fact has recently been brought into prominent notice in connexion with our recruits. This state of things is a national disgrace. It is solely due to our faulty dietetic customs—above all to the practice of eating sweets and soft farinaceous food, which leaves the mouth in a chronic unhygienic condition. I estimate that there are among the inhabitants of these islands upwards of 200 millions of carious teeth, and probably an even greater number of socket abscesses (pyorrhœa alveolaris), while as to the jaws, it is rare to meet a normal one. One of the first things which strike the observant foreigner when he lands upon our shores is the large number of people with false teeth, and the great length and prominence of the natural teeth—a feature which the continental cartoonist has not been slow to accentuate. These obtrusively large teeth constitute a damning indictment against our habit of consuming nearly all our vegetable food in a form which does not put the teeth to adequate use. Teeth which are not put to vigorous use are not ground down as they should be, and they tend also to "grow out of their sockets," so that they, or rather the visible parts of them, become longer. This lengthening of the teeth is due in an even greater degree to pyorrhœa. Hence pap-fed people tend to be "long in the tooth."

We are happily beginning to awake to the necessity of looking after our children's teeth, and dental surgeons have been appointed to tend the teeth of the elementary-school children. This is a move in the right direction, but it is little more than shutting the stable-door after the horse has bolted. Dentists are mainly engaged in an endeavour to repair damaged teeth. Obviously our aim should be to prevent the damage, and this, as Dr. Sim Wallace has shown, can be done by choosing foods which exercise the teeth and salivary glands adequately, and by so arranging the order of them in a meal that the mouth shall be left in a sanitary condition.

So accustomed are we to the prevalence of dental disease in this country that we accept it as a matter of course. It is, however, a serious national evil, but happily one which can be remedied. The present time, when for reason of economy we are called upon to examine into and revise our dietetic habits, is a good one to put up a bold fight against it.

Wimpole-street, W.

A DEVONSHIRE CENTENARIAN.—Miss Emily Bond, daughter of the late Admiral Bond, who celebrated the hundredth anniversary of her birthday last June, died at Exeter last week.

## THE CULTURE OF MEDICINAL HERBS.

THE letter of a correspondent in our last issue (p. 749) suggests the importance of growing wintergreen and willow within the British empire to assure a supply of salicin. The culture of medicinal herbs in general is a question well worthy of consideration at the present moment.

There was a time when no village garden was complete without its bed of simples from which the medicine-chest was regularly replenished, and although with the coming of the age of machinery the practice largely lapsed in this country, it still persists unchanged in the country of our nearest neighbour and ally, now much more largely agricultural than these islands. Here during the summer and autumn months family groups may constantly be seen sitting in their courts and doorways preparing the leaves and flowers which are to form the basis of the "*tisanes*," the famous domestic remedies for all minor ills. There are, of course, a number of herb-farms in Great Britain where cultivation of certain herbs is carried out and where others have been definitely abandoned as unprofitable—e.g., in the case of dandelion root, in which the cost of cultivation is greatly more than that of digging the weed. The practice may have a kind of popular revival in this country in view of the shortage of vegetable drugs of all kinds caused by the closing of the frontiers of the Central European States with their vast tracts of land and multitudes of rural population willing to collect leaves and roots. The revival is being promoted by the Herb-Growing Association[1] which is affiliated to the Women's Farm and Garden Union, who have undertaken to give advice to their members on herb-growing and the preparation and disposal of herbs, so that the market may not be overstocked with some and be short of others. It is pointed out that since the dealers buy in hundredweights, the small grower who has only a few pounds for the market would have difficulty in disposing of her crops except for some such coöperative system as is provided by the Association.

The difficulties to be faced are not small and must be carefully studied if there is to be any prospect of success. Many herbs are very slow growing, and it is long before the medicinal property is developed. The lack of belladonna extract is largely due to the fact that the culture of the Atropa belladonna requires much ground, and that the roots are not available to lift and dry on a profitable scale until the third year. Then not every soil or situation is suitable to develop the production of the useful drug in the herb. It is well known that the opium poppy, even if it grows freely in this climate, does not yield any considerable proportion of the morphine alkaloids. It is not accidental enterprise which has located the fields of peppermint and lavender at Mitcham and Hitchin; there are certain properties in the soil and local climate which bring about a maximum yield of the essential oil in the growing Mentha piperita and Lavandula vera. Experience, too, has shown that the growing of drugs cannot successfully be undertaken for any period of years except as part of a general farm. Land very soon gets "sick" of these herbs, and the crop no longer pays for the growing. Particularly is this so with belladonna and henbane.

Collection of wild herbs, on the other hand, is simpler and offers a useful field. The collector turns his attention from one to another herb, according to the season and the larger or smaller demand. No large outlay of capital is necessary, nor any waiting for a return on the labour and money expended. But the collection of wild-flower products too has its special difficulties. The autumn crocus, more correctly colchicum, is widely scattered over the flat river-meadows in many parts of this country, and the bulbs are betrayed by the large lily-like leaves which appear in the early spring. But the bulbs lie deep, and unless closely set, as they often are in a Swiss meadow, they will require an immensity of labour and a great destruction of the surface of a meadow before any considerable quantity has been grubbed up, although we have heard of an active man who was able to earn 27*s.* a week by so doing. In the second place, the question of drying is a crucial one. In most countries where leaves and flowers are gathered they can be

[1] The secretaries of the Herbal Subcommittee of the Women's Farm and Garden Union are Miss E. L. Chamberlain, F.R.H.S., and Miss Alice Sandford, to whom communications should be addressed at 45, Queen Anne's Chambers, S.W.

left to dry in the sun or under cover in the open air and retain all their essential ingredients unimpaired. Visitors to any sub-alpine or alpine meadow in the spring or summer will have noticed how each leaf and flower retains most of its form and colour in the process of drying to hay. Up and down this country we have abundance of foxglove leaves to prepare all the tincture and infusion that we use, but unless special facilities are provided for drying them or unusual meteorological conditions prevail the leaves will become mouldy or their contained glucosides be washed out or ferment before they reach the factory where the extraction is to take place.

The Women's Herb-Growing Association has therefore embarked on an enterprise which will require both expert knowledge and much careful organisation to make it a success. And we should say that success is much more likely to attend the collection of wild herbs than their cultivation. If cultivation is undertaken we have seen that two years or more may elapse before a crop can be obtained. Then if the supply exceeds the demand this crop when obtained will be unsaleable, as the manufacturers will naturally only buy sufficient to last from season to season, avoiding an accumulation of old and deteriorated herbs. Again, the absence of supplies from Central Europe has not only greatly raised prices but has also stimulated the organised collection of wild herbs in other parts of Europe—for example, in Switzerland, Spain, and Northern Italy, whence the supply may very soon again exceed the demand. India is offering considerable quantities of drugs, such as belladonna, of which the alkaloidal content has been found satisfactory. In normal times Belgium is our chief source of valerian and camomile, and doubtless will become so again.

In Australia the question is being seriously considered by the Commonwealth authorities, and it is stated in *Science Progress* that a board has been appointed to inquire into the whole matter, and, if possible, to establish the cultivation of medicinal plants on practical commercial lines. At first it is proposed to import seeds and plants and allocate them to the high schools to be tested in the school gardens. The produce will be tested at the laboratory of the Department of Agriculture, by which means it is hoped to obtain the necessary data to allocate the various plants to the districts best suited to them. Similar help might well be provided in this country to the industry of growing medicinal herbs.

## THE SERVICES.

### ARMY MEDICAL SERVICE.

Lieutenant-Colonel G. St. C. Thom, R.A.M.C., to be a Deputy Assistant Director-General, vice Lieutenant-Colonel W. R. Blackwell.

### ROYAL ARMY MEDICAL CORPS.

The undermentioned are granted temporary rank whilst employed at the County of Middlesex War Hospital:—Temporary Major L. W. Rolleston, from the Napsbury War Hospital, to be Lieutenant-Colonel. Temporary Captain A. O'Neill, from the Napsbury War Hospital, and L. S. T. Burrell to be Majors. H. F. B. Roberts and H. C. Halsted to be Captains.

W. D. Anderson to be temporary Major.

The undermentioned to be temporary Honorary Majors:—W. I. de C. Wheeler and Temporary Honorary Lieutenant L. J. Austin, whilst employed with No. 2 British Red Cross Hospital, and Temporary Honorary Captain S. W. Patterson, whilst serving with the Australian Voluntary Hospital.

Temporary Captain A. S. Fry relinquishes his commission on appointment to the Indian Medical Service. Temporary Captain C. H. Mills relinquishes his commission.

The undermentioned to be temporary Captains:—A. S. Garden, G. J. Arnold, late Captain, R.A.M.C. (T.F.), and Staff-Surgeon G. H. Ross, Retired List, R.N.

The undermentioned temporary Lieutenants to be temporary Captains: G. M. De Vine, D. E. Derry, E. L. Mansel, T. E. Hammond, J. Marmion, C. W. Donald, F. G. Milne, T. F. Griffin, D. Bird, G. N. Lorimer, W. J. Lascelles, A. G. MacLeod, E. A. O. Travers, P. Carney, W. Thomas, J. H. Askins, H. H. Elliot, J. Sullivan, H. L. C. Noel, G. S. Phillips, M. E. Robinson, H. N. M. Puckle, R. M. Clarke, A. T. Roberts, G. D. K. Waldron, J. I. M. Jamieson, W. E. Giblin, W. A. Edwards, L. J. J. Nye, F. E. Keane, O. H. Edwards, F. Irvine, W. Smithies, H. H. Davis, C. E. Sundell, J. R. Slack, T. Sheehan, A. Wiley, F. S. Hawks, J. A. Hutchinson, F. H. Rudge, N. G. Horner, D. C. Taylor, W. W. Turner, W. M. O'Connor, H. B. Binks, A. H. Davidson, A. C. Freeth, M. L. Neylon, N. W. Steinberg, J. Hutchison, G. Riddoch, V. J. McAllister, W. W. Thomson, A. T. Paterson, A. C. A. Jekyll, C. K. Cohen, E. P. Dark, R. V. Steele, S. E. Elphick, E. J. Eedle, R. B. Hunt, C. Stuart, M. A. Farr, H. Mathewson, J. W. Wood, J. S. Caldwell, W. Morrison, R. H. Scovell, and O. H. Bowen.

E. C. Austin to be temporary Honorary Captain whilst employed at the Withington War Hospital, Manchester.

Temporary Captain S. P. Bedson, from a Service Battalion, The Northumberland Fusiliers, to be temporary Lieutenant.

The undermentioned to be temporary Lieutenants: E. C. Lindsey, J. Hewat, F. L. Gill, H. S. Gaskell, D. Morrison, P. J. Maguire, T. R. Hunter, E. J. Dermott, D. C. Suttie, G. F. Forde, W. J. McIvor, R. J. P. Waugh, W. Halliwell, B. P. Allison, T. W. Mason, G. J. Knaggs, R. W. Chapman, A. Walker, W. J. Evans, J. A. H. Telfer, F. J. H. Begg, Temporary Honorary Lieutenant J. N. Deacon, T. Perrin, F. L. Keith, H. A. Macdonald, T. P. Hutchison, J. L. Power, H. Tipping, W. A. Shafto, A. Pimm, J. E. Harford, W. W. W. Watt, and P. Figdor.

The undermentioned Cadets, Edinburgh University Contingent, Officers Training Corps, to be Lieutenants (on probation):—Lance-Corporal W. H. Ferguson, Lance-Corporal H. D. Wright, and K. P. Brown.

Canadian Army Medical Corps: Major C. P. Templeton to be temporary Lieutenant-Colonel. Lieutenants to be temporary Lieutenants: D. E. H. Cleveland, J. B. Galligan, T. A. MacKenzie, F. H. Hurlburt, M. D. Baker, E. C. Smith, D. T. Evans, J. G. Lee, and G. A. Lamont. The undermentioned temporary Lieutenants relinquish their commissions on account of ill-health: C. G. Sherowitz and F. W. Lee.

### SUPPLEMENTARY TO REGULAR UNITS OR CORPS.

Captain G. V. Stockdale to be temporary Major whilst commanding a Field Ambulance from Jan. 4th to Feb. 7th. Captain C. Lovell to be temporary Major whilst commanding a Field Ambulance.

### TERRITORIAL FORCE.

*Royal Army Medical Corps.*

Scottish Horse Mounted Brigade Field Ambulance: Major H. Richardson to be temporary Lieutenant-Colonel whilst in command of a Field Ambulance.

Yorks Mounted Brigade Field Ambulance: Lieutenant C. G. Meade to be Captain.

West Lancs Field Ambulance: Captain (temporary Major) A. P. H. Simpson relinquishes his temporary rank on alteration in posting.

Lowland Field Ambulance: Captain W. W. Greer to be temporary Major whilst in command of a Field Ambulance. Lieutenant W. Combe to be Captain.

Northumbrian Field Ambulance: Lieutenants John A. L. Magee and J. B. Sinson to be Captains.

West Lancs Casualty Clearing Station: Captain A. P. H. Simpson, from West Lancs Field Ambulance, to be Captain.

Welsh Border Mounted Brigade Field Ambulance: H. A. Higginson to be Lieutenant.

London Field Ambulance: Major W. G. Macfee, from Attached to Units other than Medical Units, to be Major.

Home Counties Casualty Clearing Station: Captain R. W. Brimacombe to be temporary Major whilst in command of a Casualty Clearing Station. Temporary Honorary Lieutenant W. Burt, from the Red Cross Hospital, Netley, to be Lieutenant.

Highland Casualty Clearing Station: F. G. Stuart to be Lieutenant.

South Midland Mounted Brigade Field Ambulance: Lieutenant W. G. Rutherford to be Captain.

East Anglia Field Ambulance: Lieutenant S. D. Graham to be Captain. Lieutenant R. J. R. Mecredy, from East Anglia Field Ambulance, to be Lieutenant.

North Midland Field Ambulance: Lieutenant T. E. A. Carr and Lieutenant (temporary Captain) G. Holmes to be Captains.

*Attached to Units other than Medical Units.*—Captain W. R. E. Williams to be Major. Captain H. F. Everett to be temporary Major whilst in command of a Field Ambulance. Captain J. J. Marsh relinquishes his commission on account of ill-health. Lieutenants E. H. Gonin and J. D. Jones to be Captains. G. H. Gill to be Lieutenant.

### JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

The opening paper in the March issue of the *Journal of the Royal Army Medical Corps* is a record of observations which have been carried out at St. Bartholomew's Hospital for the Medical Research Committee by R. L. Mackenzie Wallis, demonstrator of chemical pathology, on acute nephritis, the so-called "trench nephritis." The cases referred to in the paper were mainly under the care of Captain W. Langdon Brown, who published a preliminary note on 58 cases in the July issue of the journal. A Report on Cases of Albuminuria amongst British Troops in France, by Major B. W. Hogarth; the Bacteria of Gangrenous Wounds, by Major H. R. Dean and Captain T. B. Mouat; Plates for Masking Facial Wounds, by Captain Richard Cruise, Captain Somerville Hastings, and Sergeant Derwent Wood (A.R.A.); and Field Sanitation, by Captain E. Brooke Pike, are the titles of other interesting communications. Dr. A. T. MacConkey, of the

Lister Institute, Elstree, Herts, puts forward a plea for a collective study of tetanus in which he says: "If all those who have wounded soldiers under their care will combine to study the disease and each give their help towards deciding upon the value of (1) the various premonitory symptoms; (2) the intraspinal method of administration; and (3) large doses of antitoxin, it is quite possible that we may make good progress in the direction of solving the problem of the successful treatment of tetanus."

## VITAL STATISTICS.

### HEALTH OF ENGLISH TOWNS.

In the 96 English and Welsh towns with populations exceeding 50,000 persons at the last Census, 8333 births and 5877 deaths were registered during the week ended Saturday, April 1st. The annual rate of mortality in these towns, which had been 17·2, 17·9, and 16·4 per 1000 in the three preceding weeks, rose in the week under notice to 16·9 per 1000 of their aggregate population, estimated at 18,136,180 persons at the middle of the year 1914. During the 13 weeks of the quarter just ended the mean annual death-rate in these towns averaged 15·7, against a corresponding rate of 15·3 per 1000 in London. The death-rate last week ranged from 7·5 in Southend-on-Sea, 8·0 in Ilford, 8·1 in Edmonton, 9·4 in Enfield, and 9·7 in Barnsley, to 23·4 in Aberdare, 24·0 in Southport, 25·1 in Liverpool and in West Hartlepool, 27·6 in Sunderland, and 29·3 in Rochdale.

The 5877 deaths were 155 in excess of the number in the previous week, and included 420 which were referred to the principal epidemic diseases, against numbers increasing from 345 to 391 in the three preceding weeks. Of these 420 deaths, 134 resulted from whooping-cough, 122 from measles, 71 from diphtheria, 66 from infantile diarrhœal diseases, 20 from scarlet fever, and 7 from enteric fever, but not one from small-pox. The death-rate from these diseases was equal to 1·2, against 1·1 per 1000 in each of the two preceding weeks. The deaths attributed to whooping-cough, which had been 85, 93, and 137 in the three preceding weeks, fell to 134, and included 37 in London, 15 in Manchester, 9 in Liverpool, 8 in Birmingham, 6 each in Derby and Sheffield, and 5 each in West Ham and Leyton. The deaths referred to measles, which had been 121, 127, and 115 in the three preceding weeks, rose to 122, and caused the highest annual death-rates of 1·8 in Leicester, 2·6 in Swansea, 2·7 in Great Yarmouth, 3·3 in Stockport, and 5·5 in Rochdale. The fatal cases of diphtheria, which had been 54, 61, and 53 in the three preceding weeks, rose to 71, of which 17 were registered in London, 6 in Birmingham, 4 each in West Ham and Liverpool, and 3 each in Stoke-on-Trent and Wolverhampton. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 60, 68, and 65, in the three preceding weeks, numbered 66 and included 14 in London, 10 in Birmingham, 5 each in Liverpool and Sunderland, and 4 in Manchester. The deaths referred to scarlet fever, which had been 13, 19, and 12 in the three preceding weeks, rose to 20, of which 7 were recorded in London and 2 in Preston. The 7 fatal cases of enteric fever were 2 below the average in the earlier weeks of the quarter, and included 2 in Manchester.

The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had steadily declined from 2257 to 1783 in the ten preceding weeks, further fell to 1768 on Saturday last; 214 new cases were admitted during the week, against 216, 193, and 210 in the three preceding weeks. These hospitals also contained on Saturday last 1427 cases of diphtheria, 242 of whooping-cough, 132 of measles, and 47 of enteric fever, but not one of small-pox. The 1465 deaths from all causes in London were 31 in excess of the number in the previous week, and corresponded to an annual death-rate of 16·9 per 1000. The deaths referred to diseases of the respiratory system, which had been 344, 405, and 337 in the three preceding weeks, further fell to 328, and were 147 below the number registered in the corresponding week of last year.

Of the 5877 deaths from all causes in the 96 towns, 191 resulted from violence and 444 were the subject of coroners' inquests, while 1783 occurred in public institutions. The causes of 59, or 1·0 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Leeds, Bristol, West Ham, Bradford, Hull, Newcastle-on-Tyne, and in 67 other smaller towns. Of the 59 uncertified causes, 18 were registered in Liverpool, 6 each in Birmingham and Manchester, 4 in Preston, and 3 in West Bromwich.

### HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,364,500 persons at the middle of this year, 1148 births and 903 deaths were registered during the week ended Saturday, March 25th. The annual rate of mortality in these towns, which had increased from 15·5 to 20·7 per 1000 in the five preceding weeks, fell to 19·9 per 1000 in the week under notice. During the first 12 weeks of the quarter just ended the mean annual death-rate in these towns averaged 16·4 or 0·8 per 1000 above that recorded in the large English towns. The death-rate during the week ranged from 13·3 in Leith, 14·5 in Aberdeen and 15·8 in Perth, to 23·8 in Paisley, 26·8 in Greenock, and 28·0 in Kilmarnock.

The 903 deaths from all causes were 35 fewer than the number in the previous week, and included 82 which were referred to the principal epidemic diseases, against numbers rising from 56 to 89 in the three preceding weeks. Of these 82 deaths, 43 resulted from measles, 15 from diphtheria, 12 from infantile diarrhœal diseases, 8 from scarlet fever, 3 from whooping-cough, and 1 from enteric fever, but not one from small-pox. The annual death-rate from these diseases was equal to 1·8, or 0·7 per 1000 higher than that recorded in the large English towns. The deaths attributed to measles, which had been 23, 31, and 42 in the three preceding weeks, were 43, and included 21 in Glasgow and 5 each in Greenock, Coatbridge, and Kilmarnock. The deaths referred to diphtheria, which had been 10, 7, and 16 in the three preceding weeks, numbered 15, of which 5 were registered in Edinburgh, 4 in Glasgow, and 2 in Paisley. The fatal cases of diarrhœa and enteritis (among infants under 2 years), which had been 8, 8, and 11 in the three preceding weeks, were 12 in the week under notice, and included 4 in Glasgow, 3 in Dundee, and 2 in Clydebank. The deaths attributed to scarlet fever, which had been 9, 6, and 12 in the three preceding weeks, fell to 8, and comprised 6 in Glasgow and 2 in Paisley. The deaths from whooping-cough were slightly below the average in the earlier weeks of the quarter, and were recorded in Glasgow, Leith, and Kirkcaldy. The fatal case of enteric fever occurred in Glasgow.

The deaths referred to diseases of the respiratory system, which had increased from 88 to 195 in the five preceding weeks, further rose to 212 in the week under notice, and were 26 above the number registered in the corresponding week of last year. The deaths from violence numbered 29, against 29 and 26 in the two preceding weeks.

### HEALTH OF IRISH TOWNS.

In the 19 town districts of Ireland with populations exceeding 10,000 persons at the last Census, 561 births and 535 deaths were registered during the week ended Saturday, March 25th. The annual rate of mortality in these towns, which had been 21·5, 24·5, and 21·3 per 1000 in the three preceding weeks, rose in the week under notice to 24·3 per 1000 of their aggregate population, estimated at 1,148,468 persons at the middle of last year. During the first 12 weeks of the quarter just ended the mean annual death-rate in these towns averaged 20·1, against corresponding rates of 15·6 and 16·4 per 1000 in the English and Scotch towns respectively. The death-rate during the week was equal to 28·2 in Dublin (against 16·6 in London and 21·1 in Glasgow), 21·3 in Belfast, 28·6 in Cork, 19·0 in Londonderry, 16·2 in Limerick, and 26·6 in Waterford, while in the 13 smaller towns the mean rate was 22·5 per 1000.

The 535 deaths from all causes were 65 in excess of the number in the previous week, and included 45 which were referred to the principal epidemic diseases, against 51 and 38 in the two preceding weeks. Of these 45 deaths, 18 resulted from measles, 15 from whooping-cough, 5 each from infantile diarrhœal diseases and enteric fever, and 2 from diphtheria, but not one from small-pox or scarlet fever. The annual death-rate from these diseases was equal to 2·0, against corresponding rates of 1·1 and 1·8 per 1000 in the English and Scotch towns respectively. The deaths attributed to measles, which had been 12, 18, and 16 in the three preceding weeks, rose to 18, and comprised 15 in Belfast, 2 in Dublin, and 1 in Cork. The deaths referred to whooping-cough, which had been 11, 10, and 8 in the three preceding weeks, rose to 15, and included 8 in Dublin and 4 in Belfast. The fatal cases of diarrhœa and enteritis (among infants under 2 years), which had been 12, 13, and 10 in the three preceding weeks, fell to 5, of which 3 were registered in Belfast and 2 in Dublin. The 5 deaths attributed to enteric fever, comprising 4 in Dublin and 1 in Portadown, were 4 in excess of the average in the earlier weeks of the quarter. The deaths from diphtheria were recorded in Belfast and Cork.

The deaths referred to diseases of the respiratory system, which had been 95, 124, and 117 in the three preceding weeks, rose to 134 in the week under notice, but were 9 below the number registered in the corresponding week of last year. Of the 535 deaths from all causes, 172, or 32 per cent., occurred in public institutions, and 6 resulted from violence. The causes of 24, or 4·5 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest, and included 10 in Dublin, 6 in Belfast, 4 in Cork, and 3 in Wexford; in the large English towns the proportion of uncertified causes did not exceed 0·7 per cent.

# Correspondence.

"Audi alteram partem."

## THE DURATION OF LIFE AFTER INGUINAL COLOTOMY.

*To the Editor of* THE LANCET.

SIR,—An old and valued friend of mine, a well-known local solicitor, with a long record of public service, died on Feb. 18th after a comparatively short illness, at the advanced age of 84 years. I saw him in consultation with the late Dr. Samuel Fenwick and his usual medical adviser on May 23rd, 1899. He then had intestinal obstruction with severe abdominal pain, and a well-defined mass was detected in the left iliac region, but nothing was discovered in the rectum within reach of the finger. He was advised to submit to operation without delay. Two days later (May 25th, 1899) Sir Frederick Treves performed inguinal colotomy. The growth, which was circumscribed, irregular in outline, and seemed to involve the whole circumference of the gut, was situated at the highest part of the rectum close to the sigmoid flexure. The opening into the descending colon was therefore made at a higher level than usual in such cases. He made a good and rapid recovery, soon returned to his duties, and continued to work up to a few days of his death. Not many weeks ago he went to London to transact business. On more than one occasion he told me he had acquired wonderful control over his artificial anus. Under ordinary conditions he usually knew when to expect an action of the bowels, and he was seldom disturbed again the same day. The best testimony I can produce of the success of the operation is contained in a letter which has just reached me from his widow, to whom I wrote asking permission to publish this note. She writes: "Since then, he has not suffered pain—nothing more than discomfort and inconvenience, borne so patiently, and, as you know, his vigour and activity returned to him surprisingly. Probably his great energy prolonged his life and prevented him sinking into the condition of a confirmed invalid." Such a record is, I believe, unique, and must be taken into consideration in any prognosis of the duration of life after inguinal colotomy. Let me add, in conclusion, that no doubt existed in the mind of anyone present at the operation of the significance of the growth.

I am, Sir, yours faithfully,

FREDERICK S. PALMER, M.D., F.R.C.P.

Wimpole-street, W., April 3rd, 1916.

## THE SIGNIFICANCE OF CERVICAL CAPILLARY MARKINGS.

*To the Editor of* THE LANCET.

SIR,—Dr. R. Crawshaw Holt having directed my attention to the possible connexion of certain cutaneous telangiectases with pulmonary tuberculosis, I was interested when examining healthy young adult women and girls of 15 years of age to see if these markings were present. In the large majority of cases they were absent, and where I found them, with very few exceptions, I found also either signs of arrested tuberculous disease or a history more or less definite of bronchitis or pneumonia in early life. This merely points to the advisability, where such markings are present, of pursuing investigations further to see if other signs of tuberculous trouble, active or latent, may be present.

I am, Sir, yours faithfully,

Manchester, March 28th, 1916. CATHERINE CHISHOLM.

*To the Editor of* THE LANCET.

SIR,—In THE LANCET of March 4th Dr. R. Crawshaw Holt recorded under this heading his belief in the diagnostic importance of these venules, when occurring about the cervico-dorsal region of the spine, in suspected tuberculosis inside the chest when other evidence is equivocal. This provoked a statement from Dr. F. Parkes Weber that many healthy young subjects showed these appearances here and elsewhere, and Dr. Clive Riviere followed with an interesting account of some of his own observations made upon school children.

From a prolonged study of venous appearances on the skin of children of all ages, of which I have detailed records of about 250, I am inclined to discredit the view that this particular type of phenomenon has any connexion with pressure on the deep systems of veins, or with local vaso-motor disturbances due to visceral disease. The finer capillary markings found in this situation are exactly similar in size and aspect with those often to be seen on other parts. My observations tend rather to suggest that local mechanical conditions help to determine their appearance—e.g., the pressure and friction of clothing over prominent or relatively unyielding parts, or the long-continued chafing of two skin-surfaces together. Constitutional peculiarities of the skin also probably play a part. The sites of election are over the sternum, the region of the clavicles, the spinous processes of the vertebræ, and the inguinal regions, though they may, of course, occur elsewhere. They are also very persistent. Thus, in one of my cases, at the age of 5 years, a considerable number were present about the skin of the thorax, including the spinal region in question. Six years later there were still many to be found, those over the vertebræ being still visible. This child is robust, and has never shown any symptom or physical sign of tracheo-bronchial adenopathy or phthisis.

There are several other, and I think cogent, reasons for disputing the view put forward by Dr. Crawshaw Holt, but to enter into these would unduly prolong this letter.

I am, Sir, yours faithfully,

Liverpool, April 3rd, 1916. EDMUND HUGHES.

## CERTIFICATION OF THE CAUSE OF DEATH.

*To the Editor of* THE LANCET.

SIR,—I quite agree with the remarks of Dr. R. R. Rentoul in your issue of March 25th. I have advocated the careful examination of the body by the medical man who has attended the patient before giving a certificate as to the cause of death, at the same time verifying death by certain tests which I have drawn up for that purpose and published. Our society drew up certain tests of death, and promoted a Bill to amend the law relating to Registration of Deaths and to Burials, presented by Mr. George Greenwood, and supported by Mr. Atherley Jones, Mr. Rowlands, and ordered by the House of Commons to be printed June 27th, 1912.

I am, Sir, yours faithfully,

J. BRINDLEY-JAMES,

Examiner-in-Chief, London Association for the Prevention
Barnes, March 30th, 1916. of Premature Burial.

## PSYCHO-ANALYSIS.

*To the Editor of* THE LANCET.

SIR,—In a letter in THE LANCET of March 11th Dr. Ernest Jones says:—

I venture to add, without much fear of contradiction, that the statements made by more than one of your recent contributors, to the effect that they have seen many patients who have been harmed by psycho-analysis, do not refer to the patients of those who are psycho-analysts in the only legitimate sense of the word—i.e., those who have been competently trained in the subject.

This does not appear to me to be a scientific attitude of mind. Every benefit to mankind has a reverse side of possible evil, and although these chances of evil may be considerably lessened by experts in any method, a certain amount of harm is sure to accrue to a certain number of patients with regard to psycho-analysis, and it is surely a safer and more enlightened attitude to recognise the possibilities of evil and to keep on the alert to battle with the evils than to lull oneself into a false security by asserting that they do not exist. As a rule, the greater the beneficial possibilities of anything, the greater in proportion are its deleterious possibilities.

I am, Sir, yours faithfully,

Tonbridge, Kent, March 31st, 1916. C. F. STREETEN.

CHILDREN'S FRESH-AIR MISSION.—The annual meeting of the friends of the Mission will be held in Staple Inn Hall, Holborn, by the permission of the Institute of Actuaries, on Wednesday next, April 12th, at 4 P.M. Alderman Sir William H. Dunn will preside, and the following are expected to attend and speak in support of the Fund: Mrs. Scharlieb, M.D., Miss Fairbank, Mr. Ernest E. Wild, K.C., and Mr. W. Pett Ridge.

# The War.

## THE CASUALTY LIST.

**THE following names of medical officers appear among the casualties announced since our last issue:—**

*Died.*

Major F. C. Lambert, R.A.M.C., received his medical education at St. Mary's Hospital, London, qualifying in 1902, and joined the R.A.M.C. in 1904. He has been twice mentioned in despatches.

Captain J. T. Leon, R.A.M.C. (T.F.), was a student at St. Mary's Hospital, London, qualifying in 1895, and was in practice at Southsea prior to the war.

*Wounded.*

Captain M. Gross, R.A.M.C.

Captain A. Robb, R.A.M.C.

## DEATHS AMONG THE SONS OF MEDICAL MEN.

**The following sons of medical men must be added to our lists of those who have fallen during the war:—**

Lieutenant V. C. Bruce, Gordon Highlanders, second surviving son of the late Dr. A. Bruce, of Ainslie-place, Edinburgh.

Sergeant A. R. Carter, Rhodesian Regiment, elder son of the late Deputy Surgeon-General R. W. Carter.

## THE HONOURS LIST.

The *Military Cross* has been conferred upon the following medical officers in recognition of their gallantry and devotion to duty in the field:—

Captain Bernard Grellier, R.A.M.C. (attached to 10th Battalion, Royal Welsh Fusiliers).

For conspicuous gallantry and devotion to duty during operations when tending the wounded under heavy shell fire. He helped to dig out wounded men who were buried.

Temporary Captain Leonard Douglas Saunders, R.A.M.C. (attached to 10th Battalion Notts and Derby Regiment)

For conspicuous gallantry and devotion to duty. He tended the wounded under heavy fire, and finally evacuated them all with great skill and care. His clothing was torn by fragments of shell, and he was at work for 48 hours without a rest. This is the third time he has displayed great coolness and devotion to duty.

Temporary Captain Harry Vere White, R.A.M.C. (attached to 7th Battalion Lincoln Regiment).

For conspicuous gallantry and devotion to duty during operations when tending the wounded. His dressing station was repeatedly hit by shells, and he himself was severely knocked about several times, but for 36 hours he stuck to his work.

Temporary Lieutenant Reginald Peter Nutcombe Brickland Bluett, R.A.M.C. (attached to 8th Battalion Durham Light Infantry (T.F.)).

For conspicuous gallantry. He tended the wounded under heavy shell fire, and was continuously at work for 20 hours. Through his exertions they were removed to a place of safety, although the aid post was unapproachable owing to the enemy's shell fire.

Temporary Lieutenant John Alexander Harper, 52nd Field Ambulance, R.A.M.C.

For conspicuous gallantry when leading stretcher bearers during operations. On one occasion, when three of his bearers were wounded, he went alone, under heavy shell fire, to the aid post.

The name of Staff-Surgeon R. B. Scribner, R.N., is mentioned in a dispatch by Rear-Admiral Sir Dudley de Chair for good services in the patrol cruisers.

## FOREIGN DECORATIONS.

The President of the French Republic has conferred the Legion of Honour upon the following medical officers in recognition of their distinguished service during the campaign:—

*Grand Officer.*—Surgeon-General Sir A. T. Sloggett, K.C.B., C.M.G., K.H.S. (substituted for the "Croix de Commandeur," the award of which was reported in THE LANCET of Nov. 13th, 1915).

*Croix de Guerre.*—Lieutenant-Colonel J. Mill, R.A.M.C. (T.F.); Captain J. A. Cullum, Canadian A.M.C. (attached to 28th Canadian Infantry Battalion); Captain E. D. Gairdner, R.A.M.C. (T.F.); Captain G. H. R. Gibson, Canadian A.M.C. (attached to Headquarters, 1st Canadian Division).

## THE ENROLMENT OF MEDICAL MEN.

**The following statement has been published by the War Office as to the need for medical officers in the military services: it may be read as an appeal for immediate enrolment.**

In order to maintain the supply of medical officers required to meet the needs of the military services, it is urgently necessary in the interests of the civil community no less than of our armies that all qualified medical men not exceeding 45 years of age, irrespective of their circumstances, should without delay enter their names under the Enrolment Scheme which has been established by the Central Medical War Committee and has the authorisation of the War Office.

The work of enrolment is carried out by three representative bodies of the medical profession known as the Central Medical War Committee for England and Wales, the Scottish Medical Service Emergency Committee, and the Irish Medical War Committee. It should be understood that enrolment does not mean that the medical man is at once called up for service in the Royal Army Medical Corps; he may never be called up, and in any case will not be called up until the proper time has come for his services to be accepted. The real purpose of the scheme is to secure that those doctors are selected for military purposes who can best be spared at the particular date and from the particular place, with due regard to the needs of the civil population, to the personal circumstances of the doctor, and to the requirements of the armies.

To carry out efficiently the comparative process necessary for an equitable distribution of the burden as it affects the medical profession and the civil population, it is evident that all doctors of suitable age should have offered themselves for service, quite irrespective of their particular circumstances, whatever these may be, so that a proper selection may be made by a body equipped with the requisite information from all parts of the country, and thus competent to make the necessary comparisons. The only alternatives are haphazard recruitment and arbitrary demand.

It is for these reasons that the War Office has officially recognised and now relies upon the Central Medical War Committee and the corresponding committees in Scotland and Ireland. These committees include representatives of the Royal Colleges of Physicians and the Royal Colleges of Surgeons, of the universities and medical schools, and of the British Medical Association, and have associated with themselves in their work representatives of the Government departments mainly concerned. The committees have an organisation of representative local committees in all parts of the three countries, from which they obtain local information and advice, and they work in daily contact with the various Government departments concerned.

Furthermore, for the purpose of considering and advising, through the Central Committee, on cases in England and Wales, having such special features as exist, for instance, in regard to the staffs of the metropolitan hospitals, a Committee of Reference has, with the approval of the War Office, been now established by the Royal College of Physicians of London and the Royal College of Surgeons of England, acting jointly.

Thus it will be seen that, in order to secure the desired result, that is to say, to obtain the medical officers needed for the army month by month with the least possible interference with the needs of the civil population and the least possible injury to the individual practitioner, it is necessary that every medical man under the age of 45 who does not hold a certificate of enrolment (or of provisional acceptance by the War Office) should enrol at once. Only in this way can the exigencies of the situation be fairly and efficiently met.

VACANCIES FOR MEDICAL OFFICERS.—Three medical officers are urgently required to complete the establishment of the 2/1st Highland Mounted Brigade Field Ambulance. Also a regimental medical officer for the 2/2nd Lovat Scouts. Full particulars regarding pay and duties can be obtained from Major Mowat, Officer Commanding, 2/1st Highland Mounted Brigade Field Ambulance, 49, Northgate, Beccles, Suffolk.—Interesting work for medical officers in the 3/3rd Home Counties Field Ambulance, R.A.M.C. Only two or three vacancies exist, and medical men desirous of joining this unit should make immediate application to the officer commanding, at the headquarters, "Frenches," Redhill.

# OBITUARY OF THE WAR.

## ROBERT FRANCIS HEBBERT, M.R.C.S. ENG., L.R.C.P. LOND.,

CAPTAIN, INDIAN MEDICAL SERVICE.

Captain Robert Francis Hebbert, I.M.S., whose death was announced recently as having occurred in the Persian Gulf, joined St. Thomas's Hospital in 1900 as a student, having received his school education at Malvern. He combined work with play, as he took the first and second year college prizes, qualified for the Cheselden medal for surgery, and played Association football and tennis for the hospital. On obtaining his diplomas in 1906 he joined the Indian Medical Service. He will be sadly missed by all who knew and worked with him at the hospital. He had only recently married.

## PERCY HAYCRAFT BERRY, M.R.C.S., L.R.C.P. LOND.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant P. Haycraft Berry, who met his death in trying to rescue a drowning man at Barrani, Egypt, on March 10th, was 27 years of age. He was educated at Malvern, and King's College, Cambridge, where he took an honours degree in 1910 and entered Guy's Hospital the same year, qualifying in 1913. Subsequently he held the appointments of clinical assistant and assistant house surgeon at his own hospital, but was forced by the urgent calls of a general practice to help his father and to forego further appointments which he could have held in the ordinary course of events. He joined the Royal Army Medical Corps in May, 1915, as soon as he could be spared from the press of winter work, and was attached successively to the Cambridge Hospital, Aldershot, the hospital ship *Assaye* (during the Dardanelles operations), and finally to the Berks Yeomanry. A friend writes: "A keen sportsman, he gained his oar in the May races of 1908, and was one of the winners of the Browning Pairs in 1910; also he was an excellent horseman. Always keen on matters military, he derived his enthusiasm for cavalry work whilst a member of the Cambridge University Officers Training Corps. In all games he was not only a good loser but an excellent winner. He never allowed an unfailing cheerful nature to dull an unusually perceptive brain, but rather let it be the means of overcoming obstacles which proved drudgery to others. To those who knew him intimately an appreciation of his character is unnecessary; to those who did not, nothing could be more eloquent of the man than the official telegram giving particulars of his death. 'At Barrani, seeing man drowning, plunged off rock into heavy surf with all clothes on to rescue. Immediately big wave broke over him and he disappeared. Body found five hours later with large wounds head, apparently ante-mortem. Buried March 11th at Barrani with military honours.'"

## JOHN WILSON, M.B., CH.B. EDIN.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant John Wilson, who was killed in action on March 9th, aged 29 years, was born in Armadale, Linlithgowshire. He was educated at John Watson's College and Edinburgh University, where he graduated in 1909. A friend writes as follows concerning his death: "A message was received that several men lay wounded in a central trench. Lieutenant Wilson at once volunteered to go to their assistance, although it was necessary to cross absolutely open ground, swept by the fire of the hostile trenches. He reached the wounded men, bandaged up those who most required it, and was on his way back to shelter when he was fired upon by the Germans from their front-line trenches. A bullet struck him just above the heart and he died in a few minutes. His colonel says that Lieutenant Wilson by his energy and devotion to duty had earned the appreciation of every officer and man in the battalion, and only ten days before had the pleasure of recommending him for the Military Cross. To his professional colleagues and friends the news of Lieutenant Wilson's death brought grief and horror. He was beloved by all who knew him, and to his *clientèle* his loss is irreparable. Genial and obliging in disposition, intelligent and industrious in the prosecution of his work, transparently honest and straight in all his relationships with others, he was a man whom it was good to know."

## CHARLES STRICKLAND, L.R.C.P. LOND., L.R C S. EDIN.,

FLEET-SURGEON, ROYAL NAVY (RETD.).

MANY naval surgeons and St. Bartholomew's men of the early "eighties" will hear with regret of the death of Charles Strickland, which occurred after nine months' illness borne cheerfully with great patience. He entered the medical profession in 1880, rather later than most of his contemporaries, as he had been obliged to live for some time in South Africa on account of pulmonary tuberculosis, the disease which recurred last year. Strickland had a happy disposition, thoroughly enjoyed his life, and his genial nature made him a social success both at the hospital and in the services. When the war broke out he was Fleet-Surgeon at the Royal Marine Light Infantry Barracks, Forton. Soon after this he was placed on the retired list on account of age, but he remained at this post until ill-health necessitated sanatorium treatment. He died somewhat suddenly on March 25th, at the age of 56. His funeral, a naval one, took place on March 31st at the Highland-road Cemetery, Southsea.

---

THE LATE MR. H. S. LYLE.—Henry S. Lyle, who had been senior honorary surgeon at the Liverpool Cancer and Skin Hospital for some 24 years, died at his residence, Upper Parliament-street, Liverpool, on March 29th. He qualified as a Member of the Royal College of Surgeons of England in 1880 and earned a well-deserved reputation as a dermatologist in Liverpool. He was civilian medical officer to the 9th King's (Liverpool Regiment).

### THE CENTRAL MEDICAL WAR COMMITTEE.

A meeting of the Committee was held on Wednesday, April 5th, at which the most important business transacted was the approval by the Committee of the formation of a Compassionate Fund, to be used for the benefit of medical men joining the military services. The Committee decided to ask the Council of the British Medical Association to consider the desirability of instituting such a Fund. No evidence was placed before the Committee, in a Memorandum which had been approved by the Executive Subcommittee, that any special fund would be needed, but it appeared from many indications that it was advisable that some scheme for its formation should be put into readiness. The Memorandum pointed out rightly that the heaviest tax might be upon those who are relatively well off and least likely to mention their position. The losses of men in consulting practice, for example, owing to heavy commitments in the matter of rent, might be considerable, while their practices, being of a personal nature, would suffer during their absence.

The Committee considered the statement recently published by the War Office with regard to the enrolment of medical men, and several speakers dwelt upon the necessity of ascertaining with accuracy the number of medical men who are available for enrolment, as only in this way can it be gathered what proportion of medical men have enrolled and how far the burden is being fairly distributed under the scheme. It was generally recognised that the scheme could only be persevered with if the percentage of enrolment was high, 75 per cent. being the lowest figure mentioned. It was pointed out in the Committee that the Navy also needed medical officers and might need more. The statement concerning enrolment issued by the War Office must to some extent be read as indicating the needs of the Navy, a matter upon which the two services will come to some agreement. The following resolution was adopted :—

The Committee will not proceed to call up practitioners under the Enrolment Scheme unless and until 75 per cent. of those medical men in England and Wales, who on Jan. 5th, 1916, were of military age and not holding a commission, have enrolled, or have since that date received a commission in His Majesty's Forces or a letter of provisional acceptance. Military age for this purpose means under 45 years of age.

The official correspondence with regard to the formation of the Advisory Committee of the Royal College of Physicians of London and the Royal College of Surgeons of England was placed before the Committee. The names of the members of the Committee were published in THE LANCET last week. Mr. Frederick G. Hallett, the secretary of the English Conjoint Examination Board, is acting as secretary of the Committee, and formally announced that the body had been constituted, that its meetings would take place at the Royal College of Physicians of London, and that the office of the Committee would be at the Examination Hall, 8 to 11, Queen-square, Bloomsbury.

---

THE MILITARY HOSPITALS IN ALEXANDRIA.—A correspondent writes as follows: "Profiting by the opportunity offered by a few days' sojourn in Alexandria I have visited some of the military hospitals which have been established there during the past 12 months. There are four 'general' hospitals. No. 15 is in a large school in the centre of the town; No. 17 is at Victoria, a seaside residential suburb, also in college premises; No. 19 occupies the splendid Deaconess Hospital buildings and some adjacent schools; while No. 21 is housed in the Ras-el-Tin barracks, Alexandria, hard by the Sultan's palace. In addition to these, No. 5 Indian Hospital and the Bombay Presidency Hospital occupy the Casino at Ramleh. In many cases these premises, capacious and well-equipped though they were before the war, were inadequate for the demands put on them, and various adaptations have been carried out. Perhaps the most remarkable of these feats are those which have been necessitated by the equipment of theatres. It is impossible even for the hardened pessimist to avoid a lively sense of gratification in realising what our much-criticised doctors and soldiers are capable of doing in such an emergency as this. But it is not the theatres only that afford evidence of thoroughness and care in the carrying out of so difficult a task. The wards, the X ray rooms, and the sanitary arrangements all bear unmistakable marks of the same spirit of thoroughness. When extensions beyond the walls of the original premises have proved necessary marquees have been widely used as overflow wards. Where so much excellent work is being done it would be invidious to make special mention of individual officers, but as certain hospitals have undertaken particular tasks it is perhaps permissible to remark upon the splint factory at No. 21 General Hospital, the venereal wards at No. 17, and the important researches into dysentery at No. 19. At all the hospitals surgery of a very high order has been practised, the records of which, when collated and digested, will prove of material value in the future. The other day a foretaste of this was afforded by the discussion which the Alexandria Clinical Society held at No. 17 General Hospital on the treatment of head injuries. This will probably be reported fully. The discussion, which was opened and closed by Colonel Sir Victor Horsley, was listened to by over 100 officers. It is, perhaps, in the department of medicine, however, that these hospitals have done their finest work. The arrangements for dealing with large numbers of dysentery and enterica cases are everywhere admirable, and the results both in regard to recovery and spread of infection have been most gratifying. The re-discovery of the value of emetine in amœbic dysentery by Sir Leonard Rogers was made in the nick of time, and has saved scores of lives. No Briton who has visited these hospitals could fail to be proud of their equipment, organisation, and actual performances."

---

# Medical News.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the First Professional Examination of the Conjoint Examining Board held on March 28th, 29th, 30th, and 31st, and April 1st and 3rd, the following candidates were approved in the undermentioned subjects :—

*Chemistry and Physics.*—Alexander Herbert Bean and Hugo Boger, University College; Walter Richard Baxter Booth, Manchester University; Percy Croad Brett, St. Mary's Hospital; John William Chadwick, Manchester University; George William Cheater, King's College; John Joseph Coghlan, London Hospital; Redgewell George Dansie, King's College; Ralph Martin Ealand, Bristol University; Mohammed Nour Eldin, St. Bartholomew's Hospital; Riad Akhnookh Fancus, Manchester University; James Hasaall France (special); Werner Göthe, Middlesex Hospital; Thomas Hodgson Jordan Hargreaves, Royal Albert Memorial College, Exeter; Albert Reby Jones, Liverpool University; Thomas Trefor Jones, Manchester University; Reginald Oladipo Lahanmi and Reginald Cyril Lightwood, King's College; John Andrew Mackay-Ross, St. Bartholomew's Hospital; Edgar Duncan MacMillan, South-Western Polytechnic; Hussein Nosrat, University College; Leslie Penhall Phillips, King's College; Henry Christoffers Powell, Charing Cross Hospital and King's College; Johannes Jacobus Redelinghuys, University College; Thomas Roger Rees, University College, Cardiff; Mary Jane Ripley, University College; Jacques Spira, Brussels University and King's College; Edward Howard Strange, University College, Cardiff; Harold John Vane Sutton, Middlesex Hospital; John Christopher Twomey, Liverpool University; John George Walker (special); Albert Charles Zwaris Wijayaratne, University College; Tudor Williams, University College, Cardiff; and Charles Florance Young, London Hospital.

*Chemistry.*—Mark Louis Barst, London Hospital; Henry Leigh Bowen, King Edward's School, Birmingham; Maxwell Hall, Guy's Hospital; Reginald Rowley Halsall and David Hoole, Manchester University; John Dougan Kelson, London Hospital; Daniell Maximos, King's College; Edgar Lewis Jones Reason, St. Mary's Hospital; Constance Elizabeth Marlar Ridout, University College; Herbert Leyland Sackett, St. Bartholomew's Hospital; Mohamed Sidky, Middlesex Hospital; Samuel Snelson, Manchester University; and John Oscar Morgan Wade, University College, Cardiff.

*Physics.*—Douglas Robert Ainsworth and Hitchon Seater Chadwick, Manchester University; Harold Spencer Davies, University College, Cardiff; Mohammed Abdel Kader El Hennawy, St. Mary's Hospital; Sydney Hazeldine, University College; Montague Henry Lichtenstein, Manchester University; John Frederick Charles McColl and Elizabeth Esther McCulloch, Liverpool University; Oswald Edgar John McOustra, University College; Madeline Phyllis Parker, London School of Medicine for Women; Benn Roland Reynolds, University College, Cardiff; Josef Sonenberg-Bergson, Breslau University and King's College; and Sidney Bertrand Winnick, London Hospital.

*Elementary Biology.*—Charles Spencer Anderson, St. Mary's Hospital; Henry Edwards Archer and Douglas Albert Raoul Aufranc, Middlesex Hospital; George Frederick Baxter, Westminster Hospital and King's College; Ivy Constance Beach, London School of Medicine for Women; Alexander Herbert Bean, University College; Margaret Gladys Best, London School of Medicine for Women; Israel Blain, Manchester University; Hugo Boger, University College; Harold Bridgewater Bramley, Liverpool University; Ernest Brazao, Middlesex Hospital; Percy Croad Brett, St. Mary's Hospital; Mary Burfield, London School of Medicine for Women; Kenneth Entwisle Bury, St. Thomas's Hospital; Edward Joseph Jean Buyck, King's College; Louis Ely Reginald Carroll, St. Bartholomew's Hospital; John William

Chadwick, Manchester University; George William Chester, King's College; Marion Constance Vera Clarke, London School of Medicine for Women; Alice Maud Mary Clegg, Technical School, Liverpool; Dudley Hugh Cockell, St. Bartholomew's Hospital; John Joseph Coghlan, London Hospital; Gerald Cecil Wootton Curson, Guy's Hospital; Redgewell George Dansie, King's College; Harold Spencer Davies, University College, Cardiff; Thomas Draper and Henry Dryerre, Royal College, Edinburgh; Robert Douglas Flintan, St. Thomas's Hospital; Harold Bert Flooks, University College, Cardiff; William Francis Gawne, Technical School, Liverpool; Barnett Goldfoot, St. Bartholomew's Hospital; Werner Göthe, Middlesex Hospital; Maxwell Hall, Guy's Hospital; Henry John Henderson, South-Western Polytechnic; John Herbert, Guy's Hospital; David Hoole, Manchester University; Francis Joselin Jauch, Birkbeck College; Henry Jennings and Silas Glynne Jones, Technical School, Liverpool; Thomas Trefor Jones, Manchester University; Henry David Kelf, Birkbeck College; John Dougan Kelson and Henry Alfred Connor Kite, London Hospital; Agnes Knowles, London School of Medicine for Women; Francis Knoyle, Birkbeck College; George Valentine Chapman Last, Technical School, Liverpool; Montague Henry Lichtenstein, Manchester University; Reginald Cyril Lightwood, King's College; Henry Davies Llewellyn, University College, Cardiff; John Andrew Mackay-Ross, St. Bartholomew's Hospital; Colin Campbell Mackinnon, Middlesex Hospital; Oswald Edgar John McOustra, University College; Cyril Randell Martin, Birkbeck College; Albert Edward Mills, Bristol University; James Aird Morton, St. Bartholomew's Hospital; Daniel Joseph O'Meara, Guy's Hospital; Leslie Penhall Phillips, King's College; Henry Christoffers Powell, Charing Cross Hospital and King's College; Mary Colegrave Prideaux, London School of Medicine for Women; Thomas Roger Rees, and Benn Roland Reynolds, University College, Cardiff; Constance Elizabeth Marian Ridout and Mary Jane Ripley, University College; William Sleeman Roberts, St. Mary's Hospital; Edith Marjorie Rooke and Margaret Charlotte Scrace, London School of Medicine for Women; Ronald Cunliffe Shaw and Samuel Snelson, Manchester University; Edward Howard Strange, University College, Cardiff; Harold John Vane Sutton, Middlesex Hospital; Joseph Gillison Tait, Edinburgh School of Medicine; Thomas Ben Thomas, St. Bartholomew's Hospital; Norman Victor Wadsworth, Guy's Hospital; William Walsham, St. Mary's Hospital; John Stanley White, St. Bartholomew's Hospital; and Catherine Mabel Williams and Greta Isabel Yeoman, London School of Medicine for Women.

**UNIVERSITY OF LONDON.**—At examinations for internal and external students, held recently, the following candidates were successful:—

SECOND EXAMINATION FOR MEDICAL DEGREES, PART I.

John Vernon Cannadine Braithwaite and William Mark Brown, Guy's Hospital; Michael Waldo Boone Bulman, London Hospital; Leslie Burvill-Holmes, Guy's Hospital; Ernest Edwin Carter, St. Thomas's Hospital (distinction); Francis Cavers, University College; Alix Jeanne Churchill, London (Royal Free Hospital) School of Medicine for Women; Harris Cohen, University College, Cardiff; Hyman Solomon Cohen, London Hospital; Morris Cohen, Guy's Hospital; Simeon Moses Cohen, University College, Cardiff; Florence Edith Coombes, London (Royal Free Hospital) School of Medicine for Women; Daryll Cedric Corry, University College; Carl Knight Cullen, London Hospital; Beryl Dyer, London (Royal Free Hospital) School of Medicine for Women; Edwin Spencer Etheridge, University College; James Fanning, London Hospital; James O'Farrell Fletcher, St. Mary's Hospital; Raymond Eustace Ford, University of Sheffield; Reginald Stafford Foss, St. Thomas's Hospital; Dennis Herbert Geffen, University College; Edward Emile Delisle Gray, Guy's Hospital; Robert Handley Greaves, University of Sheffield; Dorothy Margaret Greig, Hilda Treloggen Haggett, Edith May Hall, Joan Margaret Redford Harris, and Eleanor Harse, London (Royal Free Hospital) School of Medicine for Women; Henry Lewis Heimann, University College; Christopher Langton Hewer, St. Bartholomew's Hospital; Gilbert Rashleigh Hull, St. Thomas's Hospital; Graydon Hume and Reginald Cyril Bell Ledlie, Guy's Hospital; John Neil Leitch, St. Bartholomew's Hospital; Horace Sharman Le Marquand, St. Thomas's Hospital; Henri Toussaint Levieux, Guy's Hospital; Gdal-Leizer Levin, King's College; Hyman Jacob Levy, University College, Cardiff (distinction); William Ernest Lloyd, St. Bartholomew's Hospital; Syed Francis Mahmood, University College, Cardiff; Charles Dundas Maitland, St. Thomas's Hospital; Ida Caroline Mann, London (Royal Free Hospital) School of Medicine for Women; Maurice Marcus, London Hospital; Grant Massie, Guy's Hospital; Kathleen Harding Matthews and Anna Miller, London (Royal Free Hospital) School of Medicine for Women; Richard Maurice Hoyle Newbery, St. Mary's Hospital; Sybil Gertrude Overton, London (Royal Free Hospital) School of Medicine for Women; Jal Pestonji Padshah, University College; Wilfrid Walter Payne, Guy's Hospital; Reginald Ernest Pleasance, University of Sheffield; Rowan William Revell, University College; William Arthur Richards, University College, Cardiff; Owen William Roberts, King's College; Samuel Rosenschein and Charles Herbert St. John, Guy's Hospital; Ruth Mary Scutt, Olive Ballance Sharp, and Katherine Jane Shaw, London (Royal Free Hospital) School of Medicine for Women; Gerald Maurice Joseph Slot, St. Paul's School; Sonia Straschun, London (Royal Free Hospital) School of Medicine for Women; Muriel Amy Sutton, University College; Vanda Patten Thomas, Ruth Catherine Townshend, and Norah Edith Trouton, London (Royal Free Hospital) School of Medicine for Women; Noël Sydney Bailey Vinter, St. Bartholomew's Hospital; and Evelyn Cecil Whitehall-Cooke, St. Thomas's Hospital.

SECOND EXAMINATION FOR MEDICAL DEGREES, PART II.

Lena Cecilia Adam, London (Royal Free Hospital) School of Medicine for Women; *†‡Gerald Victor Wright Anderson, University College; Loveday Shackell Banes and Annie Hardy Banks, London (Royal Free Hospital) School of Medicine for Women; Monty Baranov, University College; Mary Rushton Barkas, London (Royal Free Hospital) School of Medicine for Women; Anthony Blackstock, King's College; John Douglas Magor Cardell, St. Thomas's Hospital; Wilfred Bayley Christopherson, St. Bartholomew's Hospital; Charles Eric Cobb, St. Thomas's Hospital; Doris May Collins, London (Royal Free Hospital) School of Medicine for Women; Hedley Chave Cox and Ralph Coyte, St. Bartholomew's Hospital; Joyce Emily Cragga and Nora Annie Crow, London (Royal Free Hospital) School of Medicine for Women; Thomas Morris Davies, St. Mary's Hospital; †Mary Day, London (Royal Free Hospital) School of Medicine for Women; Edwin Frank Deacon, Guy's Hospital; †Elizabeth Denniston and Lilian Mabel Fisher, London (Royal Free Hospital) School of Medicine for Women; Gerald William Thomas Hunter Fleming, University of Durham; Abraham Foner, London Hospital; St. George Bernard Delisle Gray, Guy's Hospital; Magdalena Augusta Hilda Hamel, London (Royal Free Hospital) School of Medicine for Women; †Albert William Holgate, University College; Henry Nevill Hornibrook and Marshall Jackson, St. Bartholomew's Hospital; Vasant Ramji Khanolkar, University College; Muriel Elsie Landau, Mary Kathleen Forsaith Lander, and Alice Lloyd Lloyd-Williams, London (Royal Free Hospital) School of Medicine for Women; Ernest Kenneth Macdonald, St. Thomas's Hospital; Janet McAllister McGill, Kathleen McCrie McKeown, Gladys Matthews, and Vida Sara Maxwell, London (Royal Free Hospital) School of Medicine for Women; Ludlow Murcott Moody, King's College; Edith Mary Ponsonby Morris, London (Royal Free Hospital) School of Medicine for Women; John Ernest Nicole, King's College and Westminster Hospital; Marguerite Henrietta Pam, London (Royal Free Hospital) School of Medicine for Women; Rowland John Perkins, St. Bartholomew's Hospital; Dorothy Priestley Priestley, University of Leeds; Mary Millicent Prior, London (Royal Free Hospital) School of Medicine for Women; Ernest Frank Rabey, Middlesex Hospital; Edward Douglas Thomas Roberts, St. Thomas's Hospital; Hugh Thornton Rymer, King's College; Edward Jeffrey Samuel, King's College and Charing Cross Hospital; Solomon Nahum Senitzky, London Hospital; Bryan Buckley Sharp, St. Bartholomew's Hospital; Joseph Harold Sheldon, King's College; Charles Ernest Alan Shepherd, King's College and St. George's Hospital; Bertram Leslie Slater, London Hospital; Frances Minnie Spickett, London (Royal Free Hospital) School of Medicine for Women; Gilbert Patrick Staunton and Nai Synn, St. Bartholomew's Hospital; Khiam Soon Tan, University College; Stanley Roy Tattersall, St. Thomas's Hospital; Aubrey Leonard Telling, University of Leeds; Cyril James Thomas, St. Thomas's Hospital; Elsie Maud Visick, London (Royal Free Hospital) School of Medicine for Women; Robert Lawrence Walker, St. Mary's Hospital; *Austin Darley Wall, St. Bartholomew's Hospital; Arthur Elston Ward, St. Thomas's Hospital; Eugene Wolff, University College; and Sydney Carver Woodhouse, London Hospital.

* Distinguished in Anatomy. † Distinguished in Physiology.
‡ Distinguished in Pharmacology.

N.B.—This list, published for the convenience of candidates, is issued subject to its approval by the Senate.

**UNIVERSITY OF MANCHESTER.**—At examinations held recently the following candidates were successful in the subjects indicated:—

THIRD M.B. AND CH.B. EXAMINATION.

A. B. Platt.

SECOND M.B. AND CH.B. EXAMINATION.

Elizabeth C. Davies, Ellis Pigott, Marie Wardman, and F. L. Whincup.

*Physiology.*—James Yates.

FIRST M.B. AND CH.B. EXAMINATION.

*Part I., Inorganic Chemistry and Physics.*—May Ashburner, Martha F. Barritt, May Blakiston, Vincent Chadwick, Margaret M. Corbold, J. W. Crawshaw, K. V. Deakin, Dorothy M. L. Dyson, A. M. El Aguizy, Evelyn A. Garnett, Olive M. Gimson Archibald Harris, Joshua Harris, Sylvia K. Hickson, J. H. G. Holt, Arthur Ingham, H. A. Lomax, Alexander Maude, W. E. Mitchell, Doris B. Norman, Emily M. Peach, F. L. Pickett, Harry Rosenthal, Gerald Sheehan, Annie E. Sommerhalder, Doris A. Taylor, H. W. Taylor, Soloman Wand, Robert Williamson, and J. B. Wright.

*Part II., Biology.*—Samuel Adler, Martha F. Barritt, Vincent Chadwick, F. A. van Coller, Phyllis M. Congdon, Margaret M. Corbold, J. W. Crawshaw, K. V. Deakin, Dorothy M. L. Dyson, A. M. El Aguizy, H. P. Fay, F. R. Ferguson, J. B. Fulton, Evelyn A. Garnett, Sylvia K. Hickson, Arthur Ingham, John Jacobs, Irma Jéhanaart, Ernest Jones, H. A. Lomax, Alexander Maude, G. L. Meachim, W. E. Mitchell, Doris B. Norman, Emily M. Peach, Annie Rothwell, Gerald Sheehan, Florence G. Sherry, Annie E. Sommerhalder, Doris A. Taylor, H. W. Taylor, Mary I. Turner, Soloman Wand, Robert Williamson, S. J. Woodall, and J. B. Wright.

*Chemistry.*—F. R. Ferguson and J. N. Laing.

*Physics.*—F. A. van Coller, H. D. Preston, Florence G. Sherry, and Ethel D. Willis.

*Botany.*—E. L. Morgan and G. L. Taylor.

DIPLOMA IN PUBLIC HEALTH.

Harold Heathcote, M.D.

FIRST B.D.S. EXAMINATION.

*Chemistry.*—E. L. Morgan and G. L. Taylor.

DIPLOMA IN DENTISTRY (FIRST EXAMINATION).

G. H. R. Doman, G. F. Langford, and Norman Wood.

*Chemistry.*—Teresa Candon.

*Physics.*—A. L. Craggs, Frederick Torkington, and W. R. Williams.

DIPLOMA IN DENTISTRY (SECOND EXAMINATION).

*Dental Mechanics.*—Frank Lewis and Bertram Wilkinson.

*Dental Metallurgy.*—D. M. Barnes, Norman Flitcroft, R. L. R. Heelan, Frank Lewis, V. W. Morse, and Matthew Raeside.

DIPLOMA IN DENTISTRY (THIRD EXAMINATION).

R. A. Birkett, T. F. Healey, and James Kershaw.

UNIVERSITY OF SHEFFIELD.—At the Second M.B., Ch.B. Examination, held recently, the following candidates were successful:—

James Newlyn Gale (distinction in physiology), John Vickerman Mainprize, George Eldred Rae, John Ryan, Alice White, and Ethel White.

UNIVERSITY OF DURHAM: FACULTY OF MEDICINE.—At the Convocation held on March 25th the following degrees were conferred:—

*Doctor of Medicine for Practitioners of 15 Years' Standing.*—Hugh Basil Greaves Newham and Samuel Arnold Sittampalam.
*Degree of Bachelor of Medicine (M.B.).*—Arthur Farrell Renner Dove, Harold Kingston Graham-Hodgson, Ethne Haigh, George Irving, Arthur Edwin Raine, Alfred Smirthwaite, and Robert Welch.
*Degree of Bachelor of Surgery (B.S.).*—Arthur Farrell Renner Dove, Harold Kingston Graham-Hodgson, Ethne Haigh, George Irving, Arthur Edwin Raine, Alfred Smirthwaite, and Robert Welch.
*Bachelor of Hygiene (B.Hy.).*—Bloomfield George Henry Connolly (in absentia) and William Grant.

The following received the Diploma in Public Health (D.P.H.):—

Bloomfield George Henry Connolly and William Grant.

The following received the Licence in Dental Surgery (L.D.S.):—

Harold Armstrong Metcalfe, Douglas Edward Sayce, and Lawrence Somerville-Woodiwis.

UNIVERSITY OF ABERDEEN.—At the graduation ceremony on March 28th the following degrees were conferred:—

*Doctor of Medicine (M.D.).*—Archibald Douglas Pringle.
*Bachelor of Medicine (M.B.) and Bachelor of Surgery (Ch.B.).*—William Alexander, John Anderson, Mary Ann Chalmers, Arthur Joseph Hawes, Arthur Ambrose Hearne, Stanley Henry, Eva Constance Ironside, Burjorji Sorabji Kanga, Thomas Scott Law, *Robert Daniel Lawrence (second-class honours), Arthur Alexander Mackenzie, Charles Wattie Macpherson, William John Moir, *Arthur George Reid (second-class honours), †Thomas Ogilvie Robson, Albert Edward Barr Sim, and Forbes Simmers.
* Much distinction. † Distinction.

DUBLIN UNIVERSITY SCHOOL OF PHYSIC, TRINITY COLLEGE.—At the recent Hilary term examinations the following candidates were successful:—

PRELIMINARY SCIENTIFIC EXAMINATION.

*Botany and Zoology.*—George Ernest Sainsbury and Jacobus Frederik Van Staden.
*Chemistry.*—Falkland Litton Cary, Ivan Wakefield Beatty, Leo Vincent Clifford, and Richard Bernard Shaw.
*Physics.*—Maurice Nurock, John Lait, Janie Millar Cummins, Herbert Francis Mooney, William Bernard Joseph Pemberton, Robert Henry Mulhall Corbet, Doris Louisa Graham, Leonard Abrahamson, David John Browne, Francis Victor Small, Percival Israel Levitt, William James Alexander Russell, Robert Dormer, Christopher John Lawrence Brock, Robert Anthony O'Meara, Eileen Hilda Dowse, Elsie Hilda Burns, Mervyn Edmund McBrien, Edward Haslett Frazer, Thomas Donald Gordon, Patrick Joseph Healy, Isaac Levy, Charles John Shortt, Olive Baile, William Burton Fox, Joseph Ballantyne Maguire, James Alexander Smith, Essie Stuart Smyth, Moira Mary Brown, Richard Victor Dowse, Nora Griffith Samuel Wallace Jameson, James Joseph Patrick Kelly, William Theodore Micks, Eric Richard Murray, Frederik Wynand Pienaar, Henry Patrick Stack, Herbert William Strong, and Cecil Samuel Wilson.

INTERMEDIATE MEDICAL EXAMINATION.

*Part I., Anatomy and Physiology.*—Alewyn Johannes Vorster, Reuben Rosnekov, Cyril Daniel Brink, Jan Jacobus Gabriel de Kock, William Richard Burns Olive Gertrude Blackham, Henry Blundell Van der Merwe, William Bruce Briggs, and Lionel Wigoder.
*Part II., Applied Anatomy and Applied Physiology.*—Harry Lee Parker, Victor Millington Synge, Crawford Law Wilson, Lindley Albertyn, Patrick Bernard Molony, Robert Meade Daly Devereux, Mary Christina Sheppard, Johannes Cornelius Fouche, William Leech Young, William Philip Elford, Wilfred Vincent Pellissier William Sweetnam, Ernest Edward Rollins, Kenneth Greer, Thomas Hugh Robinson McKiernan, Paul Herbert Shelley Smith, Thomas Bousefield Herrick Tabuteau, Eric James Lydon, William Alfred Shannon, Percival Atkin Dormer, Leslie James Nugent, William Frederick McConnell, Thomas Scannel McDonald, Jason Grant Bird, Ethel Marjorie Luce, Eric Stuart Ewing Mack, James Arthur William Cullen, Thomas Mulock Bentley, James Michael Hill, Daniel McElwee, Olive Gertrude Blackham, John Benson McGranahan, and Pieter Johannes Swanepoel.

FINAL MEDICAL EXAMINATION.

*Part I., Materia Medica, Pathology, Medical Jurisprudence, and Hygiene.*—Patrick Rock, Robert Wallace Nesbitt, Joseph Roland Brennan, Hirsh Brill, William James McClintock, Sydney Verner Furlong, Harry Banks, Andries Adrian Louw Albertyn, Arthur Isaac Steyn, Charles Perceval Chambers, Willem Petrus Lubbe, Crosbie Weir, Sidney Alfred Clark, Thomas Edward Hill, Fleetwood William Porter Sullivan (Materia Medica and Pathology), Michiel Christoffel Dippenaar (Pathology, completing examination), Millicent Hamilton-Johnstone (Materia Medica, Medical Jurisprudence, and Hygiene, completing examination), and Hastings Harley Molloy (Materia Medica, completing examination).
*Part II., Surgery.*—Joseph Warwick Bigger, Thomas Lane, Charles Lewers McDonagh, Louis Blumberg, Millicent Hamilton-Johnstone, Mortimer McGee Russell, Eileen Gertrude Gwynn, and Frederick John Murphy.
*Part II., Medicine.*—Joseph Warwick Bigger, Robert Clement Burke Ramsay, George William Doran, John Thorp Westby, Millicent Hamilton-Johnstone, Eileen Gertrude Gwynn, and Rupert Gordon.
*Part II., Midwifery.*—Millicent Hamilton-Johnstone, Joseph Godfrey Bird, Frank Healy, John Thorp Westby, Sydney Verner Furlong, and Henry Stephen Campion.

DIPLOMA IN PUBLIC HEALTH.

*Part I., Bacteriology, Pathology, Chemistry, Physics, and Meteorology.*—Brian Dodwell Crichton.
*Part II., Sanitary Engineering, Vital Statistics, Public Health, Hygiene, and Epidemiology.*—John Robert Dunn Holtby, Marjorie Chapman, and Florence Colquhoun.

METROPOLITAN ASYLUMS BOARD.—A three months' course of lectures and demonstrations in hospital administration for the diploma in public health will be given at the North-Western Hospital, Lawn-road, Hampstead, N.W., on Tuesdays and Fridays at 5 P.M., beginning Tuesday, May 2nd. A similar course will be given at the Grove Hospital, Tooting-grove, Tooting Graveney, S.W., on Mondays and Fridays at 5 P.M., beginning Friday, April 7th. Medical men desiring to attend at either hospital are requested to send a fee of £3 3s. to the clerk to the Metropolitan Asylums Board, Embankment, E.C., giving their full name and address.

THE MEDICAL AND DENTISTS' REGISTERS.[1]—From the Medical Register, 1916, just issued, it will be seen that the total number of registered medical practitioners up to Dec. 31st, 1915 was 43,225, the corresponding figures for 1914 being 42,378. The average number of names added to the Register by registration for the last 24 years is 1284, and for the last five years 1265. In 1915 death accounted for the removal of 774 names, as compared with 761 in 1914. The total number added to the Register in 1915 was 1526, which includes 181 colonial and 88 foreign registrations. In 1914 there were only 36 names in the foreign list, and the increase is mainly due to the inclusion of Belgian practitioners owing to the situation created by the war. The Dentists' Register for 1916, also just published, contains 5453 names, as against 5426 in the issue for 1915. The 1916 list includes 4005 graduates and licentiates in dental surgery, 9 colonial licentiates, and 14 foreign dentists.

BRITISH FIRE PREVENTION COMMITTEE.—This committee has reissued its "Air Raid Warnings," as in many cases it has been found that recommendations made last year in the matter of simple fire precautions to meet air-raid fires are again being overlooked. Warning notices to which special attention may be called here are No. 10 for hospitals and No. 11 for convalescent homes and hostels. Warning for factories and works engaged on Government contracts is No. 16, and the farmers' warning in respect of hay-ricks, stacks, and farm produce is No. 14. For voluntary workers engaged on Red Cross and similar work warning No. 28 has been specially printed to meet the requirements of their workrooms, whilst those in charge of Y.M.C.A. huts and other institutes for soldiers and munition workers should obtain No 25. Warning No. 17A deals especially with the air-raid danger, and circulars No. 18A and No. 18B refer to the general air-raid question and the ordinary householder's aspect respectively. Special notices are issued for ministers of religion in charge of places of worship; for education authorities, headmasters and headmistresses of elementary and secondary schools; and for managers of theatres, music halls, and cinema houses. Requests for notices and circulars should be addressed to the Registrar, The British Fire Prevention Committee, 8, Waterloo-place, London, S.W.

THE Holborn Maternity Centre and Invalid Kitchen, of 75 Lamb's Conduit-street, W.C., held a Baby Show on Wednesday last of infants who had for at least three months previously attended the weekly consultations of Dr. Dorothea Colman at the centre. Fifty mothers brought their babies. The judging was in the hands of Dr. Harold Waller and Miss Hadden, of the Bloomsbury District Nursing Association, assisted by Miss Thomas, and the prizes were distributed by Mrs. Parker, the Mayoress of Holborn. The Maternity Centre, which is a voluntary one, and, except for the Local Government Board grant, dependent on voluntary aid, may feel proud of this public recognition of its usefulness.

[1] Medical Register, 1916. Published for the General Medical Council by Constable and Co., London. Price 10s. 6d. Dentists' Register, 1916. Same publishers. Price 3s. 4d.

CENTRAL MIDWIVES BOARD.—Special meetings of the Central Midwives Board were held at Caxton Hall, Westminster, on March 15th and 17th, with Sir Francis H. Champneys in the chair. A number of midwives were struck off the roll, the following charges, amongst others, having been brought forward: The midwife being in attendance at a confinement and the child suffering from inflammation of, and discharge from, the eyes, and continuing so to suffer, she did not explain that the case was one in which the attendance of a registered medical practitioner was required, as prescribed by Rule E. 20 (5); she discontinued her attendance at a time when the child was so suffering; the midwife being unable to take and record the pulse and temperature of patients in such manner as to comply with Rule E. 13; not keeping her register of cases as required by Rule E. 23. A midwife, notwithstanding her omission to visit a patient on three days during the puerperium, had entered false records of daily visits and of daily pulse and temperature. Although not present at the birth of the child, a midwife made and subscribed a declaration under the Registration of Births and Deaths Act, 1874, that the child was still-born; medical aid having been sought for the patient she neglected to notify the local supervising authority thereof, as required by Rule E. 21 (1)(a); being drunk at the time of the delivery; neglecting to remove the soiled linen, placenta, and other matters from the neighbourhood of the patient and from the lying-in room as soon as possible after the labour, as required by Rule E. 10; douching the patient in a negligent and dangerous manner, using an enema syringe and employing only a single basin for the purpose, and neglecting to provide for the cleanliness and comfort of the patient, as required by Rule E. 11. A midwife not taking with her to a confinement the appliances and antiseptics required by Rule E. 2; neglecting to disinfect her hands and forearms and to wash the patient's external parts with soap and water and to swab them with an efficient antiseptic solution, as required by Rules E. 3 and 7 (b); not being scrupulously clean in every way, as required by Rule E. 1; a child suffering from serious skin eruptions on and after the ninth day, the midwife did not explain that the case was one in which the attendance of a registered medical practitioner was required, as prescribed by Rule E. 20 (5), and she did not hand to the husband or the nearest relati e or friend present the form of sending for medical help, properly filled up and signed by her, in order that this might be immediately forwarded to the medical practitioner, as required by Rule E 19. The midwife being from time to time in contact with cases of infectious illness—namely, pemphigus neonatorum—she neglected to undergo disinfection of herself, her appliances, and her clothing to the satisfaction of the local supervising authority before going to another maternity case, as required by Rule E. 5, and she did not understand and employ the antiseptic precautions required by Rules E. 3 and 7.

MEDICAL SICKNESS, ANNUITY, AND LIFE ASSURANCE FRIENDLY SOCIETY.—The annual general meeting of this society was held at the offices, 300, High Holborn, London, W.C., on March 28th, Dr. F. J. Allan presiding. Dr. Allan in his address presenting the annual report said that since the war broke out the experience of all insurance corporations had been exceptional, but that the society had done during the year a good deal of new business, and had a net gain at the close of 70 new members, while a considerable proportion had increased their insurance for sickness benefit. Nearly £20,000 had been paid during the year to members in sickness and accident benefit. The committee, he said, now proposed the reopening of the annuity fund. On the foundation of the society an annuity fund was formed, but the terms were not found equitable, and this business was discontinued. The absence of an annuity fund being now felt to be a defect, Mr. S. G. Warner, F.I.A., had been consulted, and had drawn up a scheme. Holders of annuities would be given several options, and in the event of death or surrender before the age of 65 all the premiums paid, except the first, would be returned with simple interest at 3 per cent. per annum. Members holding annuity policies under the old tables could not transfer to the new proposal. Considerable depreciation had occurred in high-class securities, and investments if realised now would suffer a loss. At the quinquennial valuation the investments had to be valued at the prices then obtaining, and it was decided to establish an investments reserve fund, to which about £4000 had been added, and the surplus balance of the management fund is being kept in hand in case of emergencies. The death of Mr. Addiscott, who had acted as secretary since 1893, and, on retirement, as actuary, was referred to. The society also mourned the loss of Mr. G. A. Heron, one of its trustees, who took great interest in the work. It was not proposed to recommend anyone to fill the vacancy, as they already had four good trustees in Sir Dyce Duckworth, Mr. W. E. Hempson, Sir Victor Horsley, and Dr. Dawson Williams. The chairman then formally moved the adoption of the report, which was seconded by Dr. Major Greenwood and duly carried. The officers for the year, submitted to the meeting in a list, were elected *en bloc*.

# Parliamentary Intelligence.

## NOTES ON CURRENT TOPICS.

*The Budget.*

CONSIDERABLE additions to taxation are proposed in the Budget which Mr. MCKENNA, as Chancellor of the Exchequer, presented on Tuesday, April 4th. In regard to income tax, the proposals are that earned income up to £500 a year shall pay 2*s.* 3*d.* in the £, instead of 2*s.* 1 1/5*d.*, as at present. For incomes between £500 and £1000 a year the rate will be 2*s.* 6*d.* in the £. By successive stages the scale is carried up to 5*s.* in the £, which will be paid on earned incomes where the total income exceeds £2500. On unearned income the new scale will begin at 3*s.* on incomes not exceeding £300, and will rise by stages of 6*d.* to 5*s.*, which will be paid on incomes exceeding £2000. These charges are subject to the existing statutory abatements and allowances. The licence duty on motor-cars and motor-cycles is to be greatly increased. The present scale in the case of motor-cars ranges from 2 guineas up to 40 guineas, and on motor-cycles there is a uniform charge of £1. The Chancellor of the Exchequer proposes that the duty on cars not exceeding 16 h.p. will be doubled, and on higher power cars trebled. Motor-cycles not exceeding 4 h.p. will pay £2 2*s.*, and above 4 h.p. three-quarters of the duty chargeable on motor-cars of like horse power. Mr. MCKENNA also proposes taxes on amusements, railway tickets, matches, and mineral waters, and increased taxes on sugar, cocoa, coffee, and chicory.

## HOUSE OF COMMONS.

WEDNESDAY, MARCH 29TH.

*The Royal Commission on Venereal Diseases.*

Mr. KING asked the Secretary to the Admiralty whether his attention had been drawn to the recommendation in the Report of the Royal Commission on Venereal Diseases that a man in the navy should not be discharged if suffering from any such disease; whether any legislation was required in order to enable effect to be given to that recommendation, and, if so, whether he was prepared to introduce such legislation.—Mr. MACNAMARA replied: I think my honourable friend will see that the questions raised in the recommendation to which he refers is one which will call for careful consideration. He is, of course, aware that the report was signed so recently as Feb. 11th, 1916, and was publicly circulated in the early days of the present month.

Mr. KING: May we be sure that it is to receive careful attention at once and not put off further?—Mr. MACNAMARA: The matter will be considered, but I can give no undertaking as to it.

Mr. KING asked the right honourable gentleman whether his attention had been drawn to the recommendation in the Report of the Royal Commission on Venereal Diseases that men joining the navy should be warned at the earliest possible moment of the grave dangers which venereal diseases involved, and that the warning should be formally repeated at intervals of not less than a year; whether the existing regulations provided for such warnings; and, if not, whether he would cause the regulations to be amended so as to secure that the recommendation of the Commissioners should be carried into effect.—Mr. MACNAMARA answered: The reply to the earlier parts of the question being in the affirmative, the last part of the question does not therefore arise.

Mr. KING asked the Parliamentary Secretary to the Local Government Board whether it was the intention of the Board to use its power under the Public Health Acts to supply drugs used in connexion with venereal diseases free to medical practitioners, as recommended in the Report of the Royal Commission on Venereal Diseases; and whether legislation was required to enable the Board to secure accurate statistical information as regarded the prevalence

of disease among persons receiving institutional treatment, as recommended in the Report of the Royal Commission, and, if so, whether it was his intention to introduce such legislation.—Mr. HAYES FISHER said in reply: I cannot say more at the present time than that the Report of the Royal Commission as a whole is under the consideration of the departments concerned.

Mr. KING: Has the right honourable gentleman considered whether a clause might not be added to the Local Government (Emergency Provisions) Bill which would bring the recommendations within the purview of the Bill?—Mr. HAYES FISHER: My right honourable friend will consider that.

Mr. KING asked the Home Secretary whether his attention had been drawn to the recommendations in the Report of the Royal Commission on Venereal Diseases with respect to the examination of prisoners; whether it was his intention to carry them into effect; and whether he would give an undertaking that no female prisoner or female person detained in a Borstal institution should be locally examined except by a woman doctor.—Mr. H. SAMUEL wrote in reply: The compulsory examination of all prisoners to the extent suggested by the Royal Commissioners would under present conditions be impracticable. These recommendations cannot be dealt with apart from the other proposals of the Commission, but the whole subject will receive careful consideration, and it is impossible at present to say what course may be taken with respect to prisons.

*Medical Arrangements in Mesopotamia.*

Sir JOHN JARDINE asked the Under Secretary for War whether steps would forthwith be taken to secure for the forces on the rivers Tigris, Euphrates, and Karun, in addition to medical and surgical requirements for the case of wounds, such drugs and appliances as had been proved useful in cases of plague, cholera, malarial fever, sunstroke, guinea-worm, and other diseases likely to occur in the approaching very hot weather in the deserts of Mesopotamia.—Mr. TENNANT replied: I can assure my honourable friend that all the resources at the disposal of the War Office, whether in personnel or in stores, have been offered to the Commander-in-Chief in India.

*Uninoculated Men in the Army.*

Mr. ANDERSON asked the Under Secretary for War whether he would issue instructions that recruits who objected to antityphoid inoculation were to be allowed leave in the ordinary way, providing they produced evidence from the medical officer of health for the district they intended to visit stating that the neighbourhood was free from typhoid fever.—Mr. TENNANT answered: The necessity of preventing the introduction of enteric fever into military camps is paramount, and this necessitates that leave shall be granted sparingly to men who object to inoculation. I do not think that the suggestion made in the latter part of the question provides sufficient safeguard that uninoculated men on leave will not bring back infection.

*Health Conditions at Fovant Camp.*

In reply to Mr. NIELD, Mr. TENNANT (Under Secretary for War) wrote: I have obtained a report from the medical officer at Fovant (Salisbury Plain) who states that no training ground there is in a condition even remotely approaching that of a muddy marsh, and that there in nothing in the condition of the training grounds that constitutes danger in any degree to the health of the troops. Four deaths occurred at Fovant last year—one from diabetes, one from nephritis, one from brain tumour, and one from bronchitis—but none of these was due to the condition of the training ground. Extensive drainage works are not necessary. Measures which have been taken will render the conditions of this training ground as good as obtains elsewhere. The ground at Fovant is good sandy subsoil and dries up remarkably quickly.

*Insurance Benefits and Medical Evidence.*

Mr. STUART-WORTLEY asked the representative of the National Insurance Commissioners whether it had been found that a woman insured in the Approved Society conducted by the Prudential Assurance Company, and receiving a weekly allowance as insurance benefit therefrom, could be deprived of that benefit by the individual decision of a referee appointed by the Prudential Company without previous knowledge of the case and without consultation or communication with her panel doctor; whether a woman thus deprived of benefit or otherwise treated with harshness could under No. 13 (30 b) of the Approved Society's rules be required, as a condition of obtaining redress or getting her case submitted for impartial inquiry, to deposit a sum which might amount to so much as £1, and in case of an adverse decision to forfeit the deposit and pay the whole of the expenses of the arbitration; whether along with the notice of deprivation of benefit any information was given to the insured person as to the existence of a right of appeal or the nature of the steps to be taken to bring about such appeal; whether the said Rule 13 was one of 48 rules which covered 72 pages of a printed book; and whether it was proposed to leave unaltered a state of the law which made benefits so precarious and redress so difficult to persons of small means from whom compulsory contributions had been levied.—Mr. CHARLES ROBERTS replied: It rests with the society of which an insured person is a member to determine, subject to the member's right of appeal, whether the facts of a given case justify the payment of benefit and medical evidence obtained in accordance with the rules is for the guidance of the society in coming to a decision. In the case of the particular society named in the question, I understand that where a member is required to submit herself for special medical examination under the rule referred to, steps are now taken to inform the doctor by whom she has been attended, and that where the matter is referred to a medical umpire, it is not the society's practice to require any deposit, although the payment of a deposit is authorised by the rule. I am also informed that in all cases in which payment of benefit is suspended on the report of a medical referee the member is now furnished with information as to the course which she may pursue if dissatisfied with the society's decision. The particulars given in the fourth part of the question are substantially correct. Copies of the rules are available to members on payment of a sum not exceeding 2*d*. As regards the last part of the question I am sending the right honourable gentleman a copy of a circular issued by my department in May last on the subject of procedure in disputes between societies and their members.

THURSDAY, MARCH 30TH.

*The Health of Munition Workers.*

Lord H. CAVENDISH-BENTINCK asked the Secretary to the Ministry of Munitions whether he was aware that the Health of Munition Workers Committee had recommended, in view of the increase of industrial disease and accidents in controlled establishments, that a sickness register should be kept, that provision should be made for the medical examination of all workers on their admission to the factory, that one or more trained nurses should be appointed, that a committee of workers should be entrusted with the duty of investigating every accident which occurred in their own workplace, that local dressing stations should be established in each workplace for minor injuries and a central dressing station for more serious cases, and that provision for organised medical treatment should be made in every munition factory; and what steps had been taken to carry out the recommendations of the committee.—Dr. ADDISON replied: My right honourable friend is about to issue to controlled establishments a circular containing a summary of the recommendations made in this and two other reports recently received from the committee. Active steps are also being taken by specially appointed officers of the Ministry to bring home to employers in certain factories the need for action on the lines recommended by the committee.

*Medical Arrangements in Mesopotamia.*

Mr. MALCOLM asked the Secretary of State for India whether Sir W. Vincent and General Bingley, being subordinate officers of the Government of India, had the power to examine and report upon the share borne by the military and financial members of the Viceroy's Council in planning and executing the Mesopotamian campaign and the shortcomings connected therewith; and, if they were precluded from so doing, would he appoint an independent commission to take the necessary evidence from the highest responsible authorities in India.—Mr. CHAMBERLAIN replied: The answer to both questions is in the negative. The inquiry is confined to the medical and hospital arrangements of the Mesopotamian campaign. I assume that it will embrace all matters relative to the sufficiency or otherwise of the provision made in India and Mesopotamia for medical personnel, stores, and appliances, also as to the organisation of medical relief and the arrangements for dealing with the sick and wounded in the field, at the base, and in transit to the base. I have issued instructions that the Commission should fearlessly ascertain and assign the responsibility for the breakdown of relief, whether individuals or the system are to blame. Until the Commission has reported I cannot say whether a further inquiry will be needed. The Viceroy has informed me that he has invited Mr. E. A. Ridsdale, Red Cross Commissioner, now *en route* from this country to Mesopotamia, to join the Commission as a member.

TUESDAY, APRIL 4TH.

*Tuberculous Soldiers.*

Mr. TENNANT (Under Secretary for War) informed Mr. R. MCNEILL that the arrangements in force were that soldiers who became medically unfit for further service from tuberculosis were not sent to their homes when discharged from the army. In the case of those who were insured under the National Insurance Act, arrangements existed with the National Insurance Commission by which men, if they desired, were sent to sanatoria. Similar arrangements existed with the Local Government Board for men who were

not insured, sanatorium treatment being provided as a special privilege.

*Hospital Accommodation at Blandford Camp.*

Mr. CAREW asked the Under Secretary for War whether he was aware of the insufficient hospital accommodation at Blandford camp, Dorset; whether recruits underwent a proper medical examination before they were called up for service; and whether information was sent to parents or friends when cases of dangerous illness occurred.—Mr. TENNANT answered: The hospital accommodation at Blandford is considered to be sufficient. Serious cases are conveyed by motor transport to Wareham, and, if necessary, to other hospitals. The answers to the second and third parts of the question are in the affirmative.

*The Eyesight of Recruits.*

Mr. TOUCHE asked the Under Secretary for War whether recruiting authorities were acting in accordance with instructions in accepting for general service men who were unable to see 6/60 with either eye without glasses.—Mr. TENNANT wrote in reply: The minimum standard of eyesight without glasses for general service is 1/4 of the normal in one eye and less in the other. Men with vision below this standard should not be accepted for general service.

# Appointments.

*Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to* THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

FARRER, R. T., M.R.C.S., L.S.A., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Brighouse District of the county of Yorks, West Riding.

GRANT, J. DUNDAS, M.D. Edin., F.R.C.S. Edin., has been appointed Surgeon in charge of the Ear, Throat, and Nose Department of the New Zealand Military Hospital, Walton-on-Thames.

MAINS, J. H., L.R.C.P. Lond., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Clackmannan District of the county of Clackmannan.

MARTIN, ROBERT COLLINS, L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the No. 1 District by the Bristol Board of Guardians.

MORGAN, ALBERT THOMAS, L.S.A. Lond., M.D. Brux., has been appointed Public Vaccinator for the Ashley District by the Bristol Board of Guardians.

MORGAN, JOHN FREDERICK HENRY, L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the No. 2 District by the Bristol Board of Guardians.

# Vacancies.

*For further information regarding each vacancy reference should be made to the advertisement (see Index).*
*When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.*

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street.—Resident Surgeon.

BIRMINGHAM GENERAL DISPENSARY.—Resident Medical Officer, unmarried. Salary £250 per annum, with apartments, attendance, &c.

BRISTOL GENERAL HOSPITAL.—Casualty House Surgeon. Also House Physician. Both for six or three months. Salary at rate of £175 per annum each, with board, residence, &c.

BRISTOL ROYAL INFIRMARY.—House Physicians and House Surgeons. Salary at rate of £120 per annum, with board, apartments, and laundry.

BRIXTON INFANT WELFARE CENTRE, 56, Tulse Hill, S.W.—Female Medical Practitioner for Wednesday Afternoon Consultations.

BURNLEY, VICTORIA HOSPITAL.—Female House Surgeon. Salary £160 per annum, with residence, board, and washing.

BURY INFIRMARY.—Senior House Surgeon. Salary £250 per annum, with board, residence, and washing.

CAMBRIDGESHIRE ASYLUM, Fulbourn, near Cambridge.—Junior Assistant Medical Officer, unmarried. Salary £200 per annum, with board, lodging, washing, and attendance.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL.—Second House Surgeon. Salary £150 per annum, with board, apartments, and laundry.

DERBY, DERBYSHIRE ROYAL INFIRMARY.—House Physician and Casualty Officer. Salary £200 per annum, with board, residence, &c.

DONCASTER ROYAL INFIRMARY AND DISPENSARY.—House Surgeon. Salary £250 per annum, with board, lodging, and washing.

DUDLEY, GUEST HOSPITAL.—Assistant House Surgeon for six months. Salary £120 per annum, with board, residence, and washing.

EXETER, ROYAL DEVON AND EXETER HOSPITAL.—Senior House Surgeon. Salary at rate of £250 per annum, with board, apartments, and washing.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

LANCASTER, COUNTY ASYLUM.—Temporary Assistant Medical Officer. Salary 6 guineas per week, with board, apartments, washing, and attendance.

LEEDS PUBLIC DISPENSARY.—Female Resident Medical Officer. Salary £130 per annum, with board, residence, and laundry.

LIVERPOOL, HIGHFIELD MILITARY HOSPITAL.—Assistant Resident Medical Officer. Salary £300 per annum, with rations, apartments, &c.

LONDON HOSPITAL.—Two Vacancies on Assistant Obstetric Staff.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W.—Assistant House Surgeon for six months. Salary at rate of 120 guineas per annum.

NEW HOSPITAL FOR WOMEN, Euston-road.—Female Senior Clinical Assistant (Out-patient Department), Thursday afternoon. Also Female Clinical Assistants. Also Female Resident Medical Officer at House of Recovery, New Barnet. Salary £60 per annum.

NORTHAMPTON GENERAL HOSPITAL.—Two House Surgeons. Salary £150 per annum each, with apartments, board, washing, and attendance.

PUTNEY HOSPITAL, Lower Common, S.W.—Resident Medical Officer. Salary £150 per annum, with rooms, board, and laundry.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Surgeons for six months. Salary £100 per annum, with board, residence, and washing.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—Examiners under the Conjoint Examining Board in England.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.—Male and Female House Physicians and House Surgeons for six months. Salary £50 per annum, with board, lodging, and washing.

SHEFFIELD, JESSOP HOSPITAL FOR WOMEN.—Female Junior House Surgeon, unmarried. Salary £80 per annum, with board, residence, and laundry.

SHEFFIELD ROYAL HOSPITAL.—Honorary Ophthalmic Surgeon.

SHEFFIELD ROYAL INFIRMARY.—House Surgeon. Salary £100 per annum, with board and residence.

SOUTHAMPTON FREE EYE HOSPITAL.—House Surgeon. Salary £100 per annum, with board, lodging, and laundry.

THROAT HOSPITAL, Golden-square, W.—Resident House Surgeon.

VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W.—House Surgeon. Salary at rate of £200 per annum, with board and lodging.

WARWICKSHIRE AND COVENTRY JOINT COMMITTEE FOR TUBERCULOSIS.—Resident Medical Officer for Bramcote Sanatorium, near Nuneaton. Salary at rate of £250 per annum, with board, &c.

WESTMORLAND CONSUMPTION SANATORIUM AND HOME, Grange-over-Sands.—Second Assistant. Salary £200 per annum, with apartments, board, and laundry.

WINCHESTER, ROYAL HAMPSHIRE COUNTY HOSPITAL.—Female Assistant House Surgeon. Salary £100 per annum, with residence, board, and washing.

# Births, Marriages, and Deaths.

## BIRTHS.

BIGGER.—On April 2nd, at Cairo, the wife of W. K. Bigger, Lieutenant, R.A.M.C., of a son.

CLARKE.—On March 28th, the wife of Lieutenant H. H. Clarke, R.A.M.C., of a daughter.

IREDELL.—On April 2nd, at Cumberland-terrace, Regent's Park, the wife of Dr. C. E. Iredell, of a son.

PARTRIDGE.—On March 28th, the wife of Victor Stanley Partridge, L.R.C.P. Lond., M.R.C.S., L.S.A. Lond., of Coldharbour-lane, S.E., Temporary Lieutenant, R.A.M.C., of a daughter.

ROBINSON.—On March 25th, at The Cottage, Blundellsands, the wife of G. Burton Robinson, Captain, R.A.M.C. (T.F.), of a son.

SPARROW.—On March 29th, at Essex-road, Watford, the wife of E. C. Sparrow, M.B., Temporary Lieutenant, R.A.M.C., of a daughter.

## MARRIAGES.

DEVINE—MILES.—On April 1st, at Our Lady and St. Joseph's, Poplar, Major J. A. Devine, D.S.O., R.A.M.C., of Winnipeg, Canada, to Mary Hilda, only daughter of the late Henry Miles, of Liverpool, and of Mrs. Miles, of Cambridge-road, Southport.

HUNTER—CAPE.—On March 31st, in London, by licence, Captain Ronald Nelson Hunter, R.A.M.C., to Isabella, eldest daughter of Mr. and Mrs. J. Wilson Cape, of Carlisle.

LEECH—BARKER.—On April 3rd, at Leonard Stanley, Ernest Bosdin Leech, M.D. (of Manchester), Captain, R.A.M.C., to Mary, daughter of the late Rev. H. Walder, of Jamaica, and widow of Robert Barker, of Marple.

LUCAS—MCKAIL.—On April 3rd, at St. James's, West Hampstead, Captain Reginald Blockley Lucas, M.B., M.S., R.A.M.C., to Cecily Helen, only daughter of Mrs. John McKail.

MALLET—ALLEN.—On April 1st, at Stoke Church, Devonport, Lieutenant H. H. Mallet, L.D.S., Dental Surgeon to H.M. Forces, B.E.F., to F. Ethel Allen, elder daughter of Lieutenant-Commander J. H. Allen, R.N., and Mrs. Allen, of Stoke.

## DEATHS.

LAMBERT.—On March 29th, died on active service, Major F. C. Lambert, R.A.M.C., aged 37 years.

LEON.—On March 30th, at Grove-road, Southsea, from cerebro-spinal meningitis, John Temple Leon, M.D. Lond., Captain, R.A.M.C.(T.), aged 50 years.

OWEN.—On April 2nd, suddenly, Samuel Walshe Owen, L.R.C.P., M.R.C.S., L.S.A., in his 66th year.

*N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.*

**The following magazines, journals, &c., have been received:**—British Journal of Dermatology, Journal of the Royal Army Medical Corps, British Journal of Inebriety, Proceedings of the Royal Society of Medicine, Practitioner, British Journal of Dental Science, Therapeutic Gazette, Journal of Nervous and Mental Disease, British Dental Journal, Revue d'Hygiène, &c.

# Notes, Short Comments, and Answers to Correspondents.

## VITAL STATISTICS OF BRITISH GUIANA.

A REPORT, prepared by Mr. George D. Bayley, Assistant Government Secretary, on the Blue-book of British Guiana for the year ended March 31st, 1915, has been presented to Parliament. It gives the population of the colony, as estimated at the end of 1914, as 309,938—161,417 males and 148,521 females. Calculated on the basis of these figures, the birth-rate for the year was 34·4 per 1000, as compared with 34·6 per 1000 in the previous year. The mean rate for the preceding five years was 30·7 per 1000. Amongst the several races representing the community the birth-rates per 1000 of population were as follows:—Portuguese, 27·4; Europeans other than Portuguese, 12·8; East Indians, 35·2; Chinese, 31·0; blacks, 35·7; and mixed races, 35·0. Of the births registered 39·9 per cent. were legitimate and 60·1 per cent. illegitimate. The death-rate was 24·5 per 1000 of the estimated population as compared with 24·2 in the previous year. The mean rate for the previous five years was 30·0 per 1000. The death-rate of each of the various races was:—Portuguese, 34·6; Europeans other than Portuguese, 12·2; East Indians, 25·3; Chinese, 28 6; blacks, 32·6; and mixed races, 20·9 per 1000 of estimated population. The deaths of children under 1 year of age numbered 1811, or 170 per 1000 births, showing a further slight decrease as compared with previous years. In this connexion it is noted that invaluable work has been done by the Baby Saving League, a scheme inaugurated by Lady Egerton (wife of Sir Walter Egerton, K.C.M.G., Governor of the Colony) to instruct mothers in the rearing and care of their infants.

The six principal causes of death throughout the colony during the past five years are given by the Registrar-General as follows:—Malarial and other fevers, 16·4 per cent.; bronchitis and pneumonia, 12·6; bowel complaints (including dysentery, diarrhœa, and enteritis), 11·3; kidney diseases, 8·2; phthisis and other forms of tuberculosis, 6·9; and diseases of early infancy (including infantile debility and icterus), 7·2. Enteric fever is notifiable, and in 1914 262 cases were notified, with 100 deaths. Antimalaria and antimosquito measures are being generally and gradually enforced, with visible signs of success. In 1906–7 33,748 cases of malarial fever were treated in the sugar estates' hospitals; at the end of 1914–15 the numbers had fallen to 8421. Quinine has been for some years sold at all the post-offices to the general public at cost price; it is also distributed at the sugar estates free to labourers. Prisoners, members of the police force, the inmates of the industrial school at Onderneeming and of the orphan asylum, and the attendants at the public institutions are also supplied by the colony with free quinine, and administration of quinine to school children is now adopted by 106 schools out of 227. Ankylostomiasis, which has engaged the attention of the medical department for several years, has considerably decreased on the sugar estates; this is attributed to improved sanitary measures and the erection of latrines. The International Health Commission (Rockefeller Foundation) has carried out an active campaign against this disease in the villages.

The hospitals and asylums were maintained during the year in an efficient condition. There are five public hospitals in the principal centres, and the outlying districts are served by dispensary hospitals. The immigration law also requires the maintenance of hospitals on every plantation on which there are indentured East Indian labourers, and those institutions are available for the treatment of emergency and pauper cases from the general community. There were 529 patients in the public hospitals at the beginning of the year, and 11,692 were admitted during the 12 months, the daily average being 484. There were 1431 deaths. In addition to those admitted to hospital, outdoor treatment was given to 39,357 persons. The daily average of inmates in the Lunatic Asylum was 770; 77 were discharged cured and 65 died. At the Leper Asylum there were 383 patients when the year began—263 males and 120 females—and during the year 88 were admitted.

## AN IMPROVED LIFE-SAVING WAISTCOAT.

A PERFECT device for keeping an individual afloat in case of sudden immersion has yet to be invented, the various collars, belts, and waistcoats intended for this purpose having the defect of bulkiness, while in the case of apparatus needing inflation circumstances may prevent the necessary operation being performed in time to save the life of the wearer, and it is conceivable that the mechanism might fail at the critical moment. In order to overcome these difficulties a waistcoat has been designed which is less bulky than others of its kind. A demonstration of this apparatus, which is named the Ever-ready Life-saving Waistcoat, was witnessed recently by our representative at the swimming baths attached to the headquarters of the Young Men's Christian Association, Tottenham Court-road, W.C., when a swimmer and a non-swimmer, fully clothed and shod with heavy boots, who each wore the waistcoat, jumped or dived into the bath, and after a momentary submersion rose to the surface and floated in a semi-upright position with the head thrown somewhat backward. The waistcoat consists of two separate waistcoats, one superimposed on the other and joined in such a manner that a layer of air is kept between them, thus assisting the buoyancy of the article. The inner waistcoat consists of a single thickness of waterproof material cut to fit the wearer, while the outer waistcoat, which fits the body loosely, is made of two thicknesses of the same material padded with kapok. (Kapok is the silky white floss developed in the fruit buds of the white silk cotton tree and has a specific gravity considerably less than that of cotton.) The trials, which were eminently satisfactory, suggest that travellers and ships' officers will find the garment useful as a life-saving apparatus, but it might be found inconvenient by members of a crew for wearing while engaged in their ordinary occupations about the ship, and most people would probably find the waistcoat uncomfortably warm save in cold latitudes or in cold weather. It can be adjusted in 30 seconds. The waistcoat is sold by the Life-saving Devices Syndicate Limited, Basildon House, Moorgate-street, London, E.C.

## SCIENTIFIC TERMINOLOGY.

BY the same post we received the following communications:—

A correspondent in Worcestershire writes: "The great scientific detective, Craig Kennedy, who is making the heart of the British public palpitate weekly at the picture houses, says in his 'book of words,' the 'Exploits of Elaine,' when describing some scientific apparatus: 'The idea had been suggested to me by the cystoscope, which physicians use in order to look down one's throat.'"

A correspondent in Canada writes that he recently had three scalpels ground by a local cutler and got a bill for "three scalping knives."

## TREATMENT OF FIBRINOUS BRONCHITIS.

*To the Editor of* THE LANCET.

SIR,—I wonder if any of your numerous readers could give me a hint as to the treatment of fibrinous bronchitis? I have at present under my care a case which has resisted all ordinary remedies and vaccine treatment; and I shall be greatly obliged if anyone will tell me of some remedy which they may have found successful in the treatment of these distressing cases. I am, Sir, yours faithfully,

March 30th, 1916. M.B.

## THE HOFFMANN-LA ROCHE CHEMICAL WORKS, LIMITED.

THIS firm, with works at Idol-lane, London, E.C., ask us to state that the Home Office has now withdrawn the warning it issued in October, 1915, against commercial houses in this country trading with the firm of F. Hoffmann-La Roche and Co., of Basle, Switzerland, of which the London firm is a branch. It appears that the warning was issued under a misapprehension as to the enemy status of the Basle firm, which is entirely Swiss, and unconnected with either Germans or Austrians.

*A Manifestation.*—The author has neglected to supply us with any name and address, so that we are unable to return his or her manuscript.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

## METEOROLOGICAL READINGS.

*(Taken daily at 8.30 a.m. by Steward's Instruments.)*

THE LANCET Office, April 5th, 1916.

| Date. | Barometer reduced to Sea Level and 32° F | Direction of Wind. | Rainfall. | Solar Radio in Vacuo. | Maximum Temp. Shade. | Min. Temp. | Wet Bulb. | Dry Bulb. | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Mar. 30 | 30·194 | W. | ... | 80 | 53 | 34 | 42 | 43 | Overcast |
| ,, 31 | 30·420 | S.W. | ... | 67 | 54 | 43 | 45 | 47 | Overcast |
| April 1 | 30·370 | N. | ... | 85 | 55 | 42 | 42 | 45 | Cloudy |
| ,, 2 | 30·2-0 | N.E. | ... | 99 | 61 | 39 | 45 | 47 | Fine |
| ,, 3 | 30 040 | S.W | ... | 99 | 67 | 41 | 42 | 42 | Foggy |
| ,, 4 | 29 966 | N.W. | ... | 90 | 53 | 42 | 44 | 46 | Cloudy |
| ,, 5 | 30 0 6 | N. | ... | 92 | 52 | 40 | 40 | 43 | Fine |

# Medical Diary for the ensuing Week.

## SOCIETIES.

**ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**

*MEETINGS OF SECTIONS.*

**Thursday, April 13th.**

DERMATOLOGY (Hon. Secretaries—A. M. H. Gray, J. E. R. McDonagh): at 5 P.M.

Mr. J. E. R. McDonagh: The Rationale and Practice of Chemo-Therapy.

N.B.—Fellows and Members of other Sections are invited to attend and to take part in the discussion.

**Friday, April 14th.**

ANÆSTHETICS (Hon. Secretaries—F. E. Shipway, Ashley S. Daly): at 8.30 P.M.

Annual General Meeting.—Election of Officers and Council for Session 1916-1917.

*Paper:*

Dr. M. S. Pembrey and Dr. F. E. Shipway: Observations on the Influence of Anæsthetics on the Body Temperature.

*Demonstrations:*

Dr. F. E. Shipway: Apparatus for the Administration of Warm Anæsthetic Vapours.

Dr. Harold Low: Apparatus for the Intratracheal Insufflation of Ether.

Dr. F. E. Shipway: Apparatus for the Intratracheal Insufflation of Ether.

Captain C. T. W. Hirsch: Modification of Waller's Chloroform Inhaler.

---

**HUNTERIAN SOCIETY, 1, Wimpole-street, W.**

WEDNESDAY.—9 P.M., Adjourned Annual Discussion on the Relationship of the Medical Profession to the State and the Community. Dr. H. J. Cardale, Dr. B. A. Richmond and others are expected to take part, and Dr. F. J. Smith will reply.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

**ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East.**

TUESDAY AND THURSDAY—5 P.M., Oliver-Sharpey Lectures:—Dr. M. S. Pembrey: The Development of the Regulation of Temperature. (Lectures I. and II.)

**ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.**

Course of Lectures on the Anatomy of the Human Body, for First-aid and Ambulance Students (open to all members of ambulance companies and first-aid classes):—

MONDAY, WEDNESDAY, AND FRIDAY.—5.30 P.M., Prof. A. Keith. 4 P.M. to 7 P.M., Exhibition of Anatomical Preparations and Specimens in the Theatre on lecture days, and between 10 A.M. and 5 P.M. in the Hall of the Museum on the following day.

**POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.**

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Fernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Fernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis. Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

**NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.**

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie) 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. B. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

**THE THROAT HOSPITAL, Golden square, W.**

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.

THURSDAY.—5.15 P.M., Clinical Lecture.

*For further particulars of the above Lectures, &c., see Advertisement Pages.*

## EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

---

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

## MANAGER'S NOTICES.

### TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION (printed on thin paper) is published in time to catch the weekly Friday mails to all parts of the world.

### ALTERATION OF INLAND SUBSCRIPTION RATES.

OWING to the alteration in the Inland Newspaper Postal rate, the postage on each copy of THE LANCET will in future be 1*d.*, and sometimes 1½*d.*

The revised Inland Subscription rates are:—

| | | | |
|---|---|---|---|
| One Year ... ... ... ... | £1 | 3 | 3 |
| Six Months ... ... ... ... | 0 | 13 | 8 |
| Three Months ... ... ... ... | 0 | 7 | 0 |

The rates for the Colonies and Abroad (thin paper edition) will be as usual:—

| | | | |
|---|---|---|---|
| One Year ... ... ... ... ... | £1 | 5 | 0 |
| Six Months ... ... ... ... | 0 | 14 | 0 |
| Three Months ... ... ... ... | 0 | 7 | 0 |

Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London County and Westminster Bank, Covent Garden Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C.

### ADVERTISEMENT RATES.

Books and Publications ... ... ...
Official and General Announcements
Trade and Miscellaneous Advertisements and Situations Vacant ... ... } Five lines and under ... ... 4*s.* 0*d.*

Every additional line, 6*d.*

Situations Wanted: First 30 words, 2*s.* 6*d.*

Per additional 8 words, 6*d.*

Quarter Page, £1 10*s.* Half a Page, £2 15*s.*

Entire Page, £5 5*s.*

Special terms for Position Pages.

Advertisements (to ensure insertion the same week) should be delivered at the Office not later than Wednesday, accompanied by a remittance.

## BOOKS, ETC., RECEIVED.

AMERICAN CLIMATOLOGICAL ASSOCIATION, Philadelphia.
Transactions, Vol. XXXI. (Year 1915).

BALE, JOHN, SONS, AND DANIELSSON, London.
Bed-sores: their Prevention and Cure. By Catherine W. Smart. Price 1*s.* net.

BLACK, A. AND C., London.
Manual of Medical Jurisprudence, Toxicology, and Public Health. By W. G. Aitchison Robertson, M.D., D.Sc., F.R.C.P.E., F.R.S.E. Third edition. Price 10*s.* 6*d.* net.

CHAPMAN AND HALL, London. JOHN WILEY AND SONS, New York.
Representative Procedures in Quantitative Chemical Analysis. By Frank Austin Gooch, Professor and Director, Kent Chemical Laboratory, Yale University. Price 8*s.* 6*d* net.

HEINEMANN, WILLIAM, London.
Twelve Lectures on the Modern Treatment of Gonorrhœa in the Male. By Dr. P. Asch (Strassburg). Translated and annotated by F. E. Gardner, M.D. Price 5*s.* net.
Emergency Surgery. By J. W. Sluss, A.M., M.D. Third edition, revised and enlarged. Price 17*s.* 6*d.* net.
Medical Ethnology. By C. E. Woodruff, M.D. Price 10*s.* 6*d.* net.
A Text-book of Nervous Diseases for Students and Practising Physicians in Thirty Lectures. By Robert Bing, Dozent for Neurology at the University of Basle. Authorised translation by C. L. Allen, M.D., Los Angeles, California. Price 21*s.* net.

LAURIE, T. WERNER, London.
Degenerate Germany. By Henry de Halsalle. Price 2*s.* 6*d.* net.

LONGMANS, GREEN, AND CO., London.
A System of Physical Chemistry. In two vols. By Wm. C. McC. Lewis, M.A. R.U.I., D.Sc. Liv. Edited by Sir William Ramsay, K.C.B., F.R.S. Vol. I. Kinetic Theory. Vol. II. Thermodynamics and Statistical Mechanics. Price 9*s.* net each.

MASSON ET CIE., Paris.
Ophthalmologie du Médecin Praticien. Par le Dr. Albert Terson. Price 12fr.

MILLS AND BOON, London.
Stammering. By Edwin L. Ash, M.D. Lond. Price 2*s.* 6*d.* net.
Manual for Nurses. By Sydney Welham. Second edition. Price 1*s.* 6*d.* net.

THACKER, SPINK, AND CO., Calcutta and London.
Collected Papers on Goitre and Cretinism, 1913-1914. By Robert McCarrison, M.D., F.R.C.P., D.Sc., Major, I.M.S.

WILLIAMS AND NORGATE, London.
The Germans. By J. M. Robertson, P.C., M.P. Price 7*s.* 6*d.* net.

## Communications, Letters &c., have been received from—

**A.**—Mr. J. Vere Arkle, Lond.; Ardath Tobacco Co., Lond.; Anglo-Syrian Trading Co., Lond.; *Advertiser's Weekly*, Lond., Publisher of; Assistant Commissioner of Police, Lond.; Messrs. Arnold and Sons, Lond.; Sergeant J. C. Anthony, Ramsgate; Association of Infant Welfare and Maternity Centres, Lond.; Lieutenant-Colonel Adami; Dr. G. Allpow, Halle-a.-d.-S.; Admiralty, Medical Department, Lond., Director-General of.

**B.**—Mr. J. Birt, Lond.; Messrs. Baughan and Co., Reading; Messrs. Bennett Bros., Salisbury; Bury Infirmary, Secretary of; Mr. H. Butterfield, Northampton; Birmingham and Midland Eye Hospital, Secretary of; Board of Agriculture and Fisheries, Lond.; Dr. G. Bardet, Paris; Mr. E. Brien, Petrograd; Messrs. W. H. Bailey and Son, Lond.; Mr. W. Bryce, Edinburgh; Mr. W. E. Balston, Potter's Bar; Dr. Byrom Bramwell, Edinburgh; Dr. D. H. Baria, Dhrangadhra; Messrs. Burroughs Wellcome and Co., Lond.; Bolton Infirmary and Dispensary, Secretary of; Birmingham City Education Committee, Secretary of; British Fire Prevention Committee, Lond., General Hon. Secretary of; Dr. Frederick E. Batten, Lond.; Dr. S. Boyd, Harrogate; Mr. J. Brindley-James, Lond.; British Red Cross Society, Lond., County of London Branch.

**C.**—Captain A. Compton, R.A.M.C.; Captain W. Hall Calvert, R.A.M.C.; Chesterfield and North Derbyshire Hospital, Secretary of; C. K.; Dr. Catherine Chisholm, Manchester; Captain J. G. Cooke, R.A.M.C., France; Messrs. E. Cook and Co., Lond.; Mr. H. Godden Cole, Liverpool.

**D.**—Dr. A. V. Dyer, Brighton; Dr. Vincent Dickinson, Lond.; Dublin University, Trinity College; Lieutenant W. J. Dilling, R.A.M.C., Woolwich; Doncaster Royal Infirmary, Secretary of; Derbyshire Royal Infirmary, Derby, Secretary of; Mr. H. Dickinson, Lond.

**E.**—Dr. G. Espejo, Boston, Mass.; Mr. G. J. Evans, Bicton Heath; Egypt, Ministry of the Interior (Lunacy Division); Mr. F. Swinford Edwards, Lond.

**F.**—Dr. R. Fortescue Fox, Lond.; Messrs. W. and G. Foyle, Lond.; Ferrocarril de Antioquia Medellin, Superintendent-General of; Mr. C. A. Fox, Combwich; Mr. J. Fyfe, Stirling; Mr. A. Fleming, Lond.; Federation of Medical Women, Lond., Hon. Secretary of; Dr. James Fletcher, Newton Heath; *Food and Work*, Lond.

**G.**—Messrs. C. Griffin and Co., Lond.; Goodwins, Ltd., Lond.; Dr. H. J. Godwin, Winchester; Captain J. Wesley Gilbert, R.A.M.C., France; Mr. V. Glendining, Watford; Mr. Kenneth Goadby, Lond.; Mr. James Green, Portsmouth.

**H.**—Mr. J. W. Hope, Lond.; Mr. F. Hargreaves, Manchester; Mr. Edmund Hughes, Liverpool; Captain T. B. Heggs, R.A.M.C.; Holborn Maternity Centre and Invalid Kitchen, Lond.; Captain F. E. M. Heggs, R.A.M.C., Rugeley; Highfield Military Hospital, Liverpool, Clerk to the; 2/1st H.M.B. Field Ambulance, R.A.M.C., Officer Commanding; Harrogate Corporation, Clerk to the; Messrs. A. Heywood and Son, Lond.; Hoffmann-La Roche Chemical Works, Lond., Secretary of; Hunterian Society, Lond.

**J.**—Jessop Hospital for Women, Sheffield, Secretary of; Messrs. Janson, Cobb, Pearson, and Co., Lond.; Mr. H. Langley Jones, Westcliff-on-Sea; J. D.; *Journal of the American Medical Association*, Chicago.

**K.**—Messrs. H. S. King and Co., Lond.; Mr. P. E. Kingsford, Herne Bay.

**L.**—Dr. J. M. Lichtenberg, New York; Dr. F. Lecalvé, Lorient; Messrs. H. K. Lewis and Co., Lond.; Captain R. M. Ladell, R.A.M.C.(T.), France; Captain A. H. Lowe, R.A.M.C.(T.), France; Local Government Board, Lond., Secretary of: Professor Harvey Littlejohn, Edinburgh; Leeds Public Dispensary, Secretary of; Dr. Arthur P. Luff, Lond.; Dr. C. E. Lea.

**M.**—Dr. W. Parry Morgan, Lond.; Major A. Mowat, R.A.M.C.; Dr. D. M. Macdonald, Arnside; Medical Sickness, Annuity, and Life Assurance Society, Lond., Secretary of; Miss Ida Meller, Lond.; Captain W. L. Maclean, R.A.M.C., France; *Midland Counties Herald*, Birmingham; Mr. Humphrey Milford, Lond.; Dr. J. N. Matthews, Manchester; Dr. S. G. Moore, Huddersfield; Mr. J. E. R. McDonagh, Lond.; Dr. Louisa Martindale, Brighton; Messrs. C. Mitchell and Co., Lond.; Metropolitan Asylums Board, Lond., Clerk to the; Maltine Manufacturing Co., Lond.; Messrs. A. R. Mowbray and Co., Oxford.

**N.**—New York Pharmaceutical Co., Bedford Springs, U.S.A.; Dr. D. Newman, Glasgow; Dr. J. N. Green Nolan, Hellinaly; National Health Insurance Commission (England), Lond.; *The Nursing Times*, Lond., Editor of.

**O.**—Dr. G. Olano, Lima.

**P.**—Mr. J. R. Purvis, Cambridge; Messrs. G. Pulman and Sons, Lond.; Mr. J. J. Pickles, Leeds; Mr. C. Arthur Pearson, Lond.; Dr. Frederick S. Palmer, Lond.; Mr. J. V. Paterson, Edinburgh; Professor C. J. Patten, Sheffield; Dr. M. Pearce Penhallow, Paignton.

**Q.**—Queensland Government Statistician, Brisbane.

**R.**—Royal Surrey County Hospital, Guildford, Assistant Secretary of; Rochester and Chatham Printing Co.; Mr. J. N. Rae, Edinburgh; Royal Society of Arts, Lond.; Royal Microscopical Society, Lond.; Mr. G. Q. Roberts, Lond.; Mrs. C. W. Rimmins, Chalfey; Royal College of Physicians, Lond.; Royal Medical Benevolent Fund, Lond., Secretary of; Royal Institution of Great Britain, Lond.; Dr. H. D. Rolleston.

**S.**—Dr. E. W. Scripture, Lond.; Dr. Thomas Steele, Hamilton; Mr. C. F. Streeten, Tonbridge; Dr. Walter G. Smith, Dublin; Miss Smith, Lond.; Sheffield Royal Hospital, Secretary of; Lieutenant H. Spong, R.A.M.C., Catterick; Dr. Stinl, France; *Sunday School Times*, Philadelphia, Associate Editor of; Sir George H. Savage, Lond.; Dr. George Smith, Henley-on-Thames; St. Andrew's Hospital, Northampton, Clerk to the; County of Stirling Secondary Education Committee; Dr. Halliday Sutherland.

**T.**—Dr. R. Stanley Thomas, Exmouth; Captain C. E. Thwaites, R.A.M.C.; Messrs. Tate and Son, Bradford.

**U.**—University College Hospital Dental School, Lond., Clerk to the; University of Sheffield, Registrar of; University of Aberdeen, Secretary of; University of Durham Faculty of Medicine; University of Glasgow, Registrar of.

**W.**—Mr. E. S. Weymouth, Lond.; Mr. C. L. H. Wallace, Lond.; Messrs. J. Wright and Sons, Bristol; Messrs. R. Walker and Sons, Leicester; Lieutenant C. Williams, Shoreham; Captain H. Lawson Whale, R.A.M.C.(T.), France; Dr. F. J. Waldo, Lond.; Messrs. Watson and Sons, Lond.; Dr. Hugh Walsham, Lond.; West London Medico-Chirurgical Society, Hon. Secretaries of; Mr. A. G. Witherby, Newbury; Mr. F. W. Waters, Adelaide; Warwickshire and Coventry Joint Committee for Tuberculosis, Leamington, Clerk to the; Messrs. Woolgar and Roberts, Lond.; Captain T. H. Whittington, R.A.M.C.; Mr. W. J. Uglow Woolcock, Lond.; Dr. A. D. Waller, Lond.; Mr. J. C. Withers, Lond.

**Y.**—Dr. W. J. Younger, Paris.

## Letters, each with enclosure, are also acknowledged from—

**A.**—Messrs. Allen and Hanburys, Lond.; Anglo-American Pharmaceutical Co., Lond., Secretary of; Dr. W. Appleyard, Bradford; Messrs. Adlard and Son, Lond.; Mr. D. Anderson, Plymouth; A. I. A.; A. G.; Mr. N. Adler, Hove.

**B.**—Dr. Brookhouse, Bromley; Messrs. Butterworth and Co., Lond.; Mrs. Bland, Abbeyleix; Mr. A. S. Blundell Bankart, Lond.; Mr. E. L. Baillieu, Lond.; Dr. W. S. Bainbridge, New York; Mr. H. Beattie, Banbury; Dr. H. Barnes, Ipswich; Dr. J. L. Bunch, Lond.; Dr. G. W. Bury, Darwen; Sir Lauder Brunton, Bart., Lond.

**C.**—Dr. H. W. Crowe, Yelverton; Mr. A. W. S. Curties, Burwash; Messrs. J. and A. Carter, Lond.; Messrs. T. Christy and Co., Lond.; Messrs. Crossley and Co., Lond.; Dr. G. P. Campbell, Falmouth, Jamaica; Casein, Ltd., Lond.; *Chester Courant*, Manager of; Lieutenant F. O. Chappell, R.A.M.C., Boulogne.

**D.**—Dorset County Council, Dorchester, Clerk to the; Delhi and London Bank, Calcutta, Manager of; Mr. R. Davis, Lond.; Messrs. Dawson and Sons, Lond.; Mr. M. J. A. Dickinson, Millom; Devon Territorial Force Association, Exeter, Secretary of; Lieutenant-Colonel Davies, R.A.M.C., Lond.

**E.**—E. C. H.; E. M. B.

**F.**—F. T. R.; Messrs. Fannin and Co., Dublin.

**G.**—Dr. S. Gill, Formby; G. N. A.; Messrs. Gordon and Gotch, Lond.; Mr. L. Gahan, Margate; G. K. C.; Captain J. Graham, R.A.M.C., France; Mr. W. Gough, Leeds; Dr. W. S. Greenfield, Elie; Dr. G. D. Green, Romford; Dr. R. A. Greeves, Lond.; G. R. R.

**H.**—Mr. P. H. Hunter, Arlesey; Miss K. Howard, Yelverton; Dr. Louisa Hamilton, Lond.; Dr. L. H. Hay, Swindon; Dr. W. M. P. Henderson, Chopwell; Messrs. C. J. Hewlett and Son, Lond.; Captain W. L. Harnett, I.M.S., India.

**I.**—I. D.; I. P. L.

**J.**—J. B. M.

**L.**—Mr. T. S. Logan, Stone; Mr. C. A. Line, Birmingham; Messrs. E. and S. Livingstone, Edinburgh; London Press Exchange, Secretary of; Liverpool Corporation, Treasurer to the; Liverpool Eye and Ear Infirmary, Secretary of; L. I.

**M.**—Mr. R. Martin, Banbridge; Dr. H. J. May, Southampton; Medical Society of London, Registrar of; Brigade-Surgeon Lieutenant-Colonel Myers, Lond.; Messrs. John Menzies and Co., Edinburgh; Manchester Corporation, Clerk to the; Metropolitan Hospital, Lond., Secretary of; Maruzen Co., Tokio; Captain H. Morrison, R.A.M.C., Wolverhampton.

**N.**—Nottingham City Asylum, Clerk to the.

**O.**—Mr. J. Offord, Lond.

**P.**—Dr. G. H. Pearson, Liscard; Dr. C. D. Pye-Smith, Huddersfield; Captain A. F. Potter, R.A.M.C., France; Staff-Surgeon J. G. Peebles, R.N., Lond.

**R.**—Dr. R. R. Rentoul, Liverpool; Dr. M. J. Ryan, Crumlin; Messrs. Robertson and Scott, Edinburgh; Dr. F. T. Ricketts, Lond.; Messrs. Robinson and Sons, Chesterfield; Mr. J. C. Ryan, Dublin; R. L. W.; Mr. H. S. Reynolds, Upwell; Royal Institute of Public Health, Lond., Secretary of.

**S.**—Dr. W. C. Sullivan, Retford; Sangli State, India, Chief Medical Officer of; Schliemann's Oil and Ceresine Co., Lond.; Salford Royal Hospital, Secretary of; Messrs. W. H. Smith and Son, Lond.; Miss S., Sandgate; Lieutenant F. R. Snell, R.A.M.C., Weymouth; S. W. H.; Messrs. W. H. Smith and Son, Northampton; Messrs. Sherratt and Hughes, Manchester.

**T.**—Dr. J. C. Thresh, Chelmsford; Mrs. Thompson, Leeds.

**V.**—Messrs. Van Houten, Lond.

**W.**—Dr. W. Hale White, Lond.; Dr. J. H. Whitaker, Lond.; Mr. J. Ward, Birkenhead; Mr. A. Wilson, Lond.